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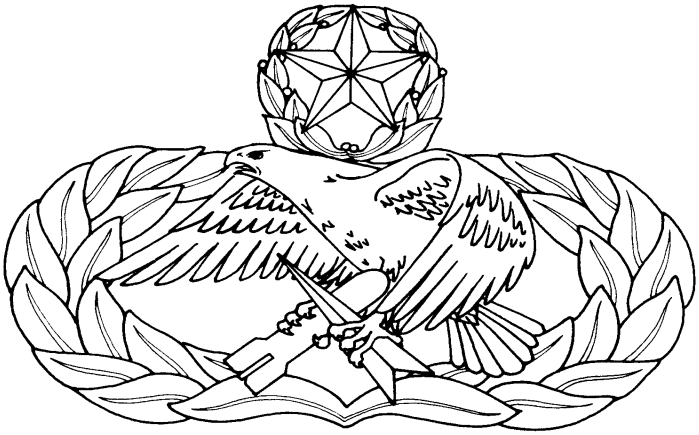
SATELLITE, WIDEBAND AND TELEMETRY SYSTEMS



CAREER FIELD EDUCATION AND TRAINING PLAN

SATELLITE, WIDEBAND AND TELEMETRY SYSTEMS
AFSC 2E1X1
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PART I

Preface

1. Resource constraints in the Air Force are impacting the availability of our most valuable resource--people. This condition, which will continue to exist in the future, makes it essential for the workforce to be effectively trained to perform duties within each skill level of an Air Force Specialty (AFS). To meet the challenges of tomorrow the Air Force must place a greater emphasis on career field training. This Career Field Education and Training Plan (CFETP) is a management tool that enables the Air Force and each MAJCOM to place the needed emphasis on total career field training. It provides the framework and guidance necessary to plan and develop a career field training program. The plan, which is a "training road map" for the career field, identifies mandatory and optional training requirements. It includes initial skills, upgrade, and continuation training that individuals should receive during their career in this specialty.

2. The CFETP, which documents the career field training program, consists of two parts. Management uses both parts to plan, manage, and control training.

2.1. Part I, Section A, provides the information necessary for overall management of training in the career field. It contains administrative details and explains the purpose and use of the CFETP. Section B provides a description of the specialty, suggests career field progression, provides career field information, documents training decisions, defines each skill level, and identifies MAJCOM continuation training options. Section C specifies qualification requirements for upgrade/progression in each subsequent skill level in the career field. It also identifies sources of training other than those provided by the Air Education and Training Command (AETC). Section D identifies known resource constraints.

2.2. Part II of the CFETP contains the Specialty Training Standard (STS) and identifies the various training sources and courses available to members of the specialty. The STS is comprised of the Course Training Standard (CTS), Specialty Training Standard (STS) and the Career Training Guide (CTG). The STS includes the tasks and knowledge requirements for award of the 3-skill level The CTG includes task and knowledge requirements for upgrade/progression to subsequent skill levels and identifies career development course (CDC) subject content. Supervisors and trainers at the unit level use Part I, Section C, and Part II of the CFETP to identify, plan, and conduct unit level training commensurate with the overall goals of this plan.

3. Use of the guidance provided in this CFETP ensures individuals in this career field receive effective and efficient training at the appropriate points in their careers. This plan enables the Air Force to train today's work force for tomorrow's jobs.

Abbreviations/Terms Explained

This section provides a common understanding of the terms that apply to the Satellite, Wideband and Telemetry Systems Career Field and Education Training Plan.

Advanced Training. A formal course of training that leads to a technical or supervisory level of an AFS. Training is for selected airmen at the advanced level of an AFS.

Air Force Enlisted Classification Directory (AFECD). The official directory of all enlisted classification descriptions, codes, and identifiers. Establishes the occupational structure of the Air Force enlisted force. The occupational structure is flexible to permit enlisted personnel to specialize and develop their skills and abilities while allowing the Air Force to meet changing mission requirements. Individual enlisted personnel have a joint responsibility with commanders and supervisors at all levels to fully develop their abilities consistent with Air Force needs and within the established patterns of specialization. Replaces AFI 36-2108.

Air and Space Expeditionary Force (AEF). An organizational structure composed of force packages of capabilities that provide war fighting combatant commanders with rapid and responsive air and space power. The AEF concept utilizes 10 individual force packages and is designated AEFs one through ten. The ten AEFs together with their support and command and control elements are tailored to meet specific combatant commanders' requirements across the spectrum of response options. An AEF, by itself, is not a deployable or employable entity. Rather, AEFs deploy within an AETF as air and space expeditionary wings, groups, or squadrons.

Air and Space Expeditionary Task Force. A deployed numbered air force (NAF) or command echelon immediately subordinate to a NAF provided as the US Air Force component command committed to a joint operation.

Air Education Training Command (AETC). Responsible for the recruiting, training, and educating Air Force personnel. AETC also provides pre-commissioning, professional military, and continuing education.

Air Force Career Field Manager (AFCFM). Representative appointed by the respective HQ USAF Deputy Chief of Staff or Under Secretariat to ensure that assigned AF specialties are trained and utilized to support AF mission requirements.

Air Force Institute for Advanced Distributed Learning (AFIADL). Provides instructional opportunities that go beyond the confines of the formal classroom. Offers professional military education, career development, and specialized technical courses. AFIADL is accredited by the Distance Education Training Council (DETC) which is one formal body recognized by the U.S. Department of Education to give accreditation to distance-learning programs.

Air Force Job Qualification Standard (AFJQS). A comprehensive task list that describes a particular job type or duty position. Supervisors use the AFJQS to document task qualification. The tasks on AFJQSs are common to all personnel serving in the described duty position.

Air Force Qualification Training Package (AFQTP). An instructional course designed for use at the unit to qualify or aid qualification in a duty position, program, or on a piece of equipment. It may be printed, computer-based, or other audiovisual media.

Air Force Specialty (AFS). A group of positions (with the same title and code) that require common qualifications.

Career Field Education and Training Plan (CFETP). A CFETP is a core training document that identifies: life-cycle education and training requirements; training support resources, and minimum core task requirements for a specialty. The CFETP aims to give personnel a clear path and instill a sense of industry in career field training. CFETPs are officially posted at http://www.e-publishing.af.mil/.

Career Training Guide (CTG). A document that uses Task Modules (TM) in lieu of tasks to define performance and training requirements for a career field.

Certifying Official. A person assigned by the commander to determine an individual's ability to perform a task to the required standard.

Computer Based Training (CBT). A forum for training in which the student learns via a computer terminal. An especially effective training tool which allows students to practice applications while they learn.

Command, Control, Communications, and Computers:, The specialized field concerned with the use of the operational continuum. C4 systems include base visual information support systems. (Joint Pub 1-02, Department of Defense Dictionary of Military and Associated Terms)

Command, Control, Communications, Computer, Intelligence and Reconnaissance (C4ISR). Integrated systems of doctrine, procedures, organizational structures, personnel, equipment, facilities, and communications designed to support a commander's exercise of command and control through all phases of the operational continuum. C4 systems include base visual information support systems. (Joint Pub 1-02, Department of Defense Dictionary of Military and Associated Terms)

Communications-Electronics (C-E): The specialized field concerned with the use of electronic devices and systems for the acquisition or acceptance, processing, storage, display, analysis, protection, disposition, and transfer of information.

Continuation Training. Additional advanced training that exceeds the minimum upgrade training requirements and emphasizes present or future duty assignments.

Core Task. A task AFCFM's identify as a minimum qualification requirement for everyone within an AFSC, regardless of duty position. Core task may be specified for a particular skill level or in general across the AFSC. Guidance for using core task can be found in the applicable CFETP narrative.

Course Training Standard (CTS). A standard developed for all courses not governed by an STS, including specialized training packages and computer-based training courses.

Critical Tasks. Critical Tasks are tasks that require specific training and certification above and beyond other tasks. Tasks may be defined as critical either through AFI, Technical Orders, higher headquarters, or at any level in the unit.

Direct Reporting Unit (DRU). Air Force subdivisions directly subordinate to the CSAF. A DRU performs a mission that does not fit into any of the MAJCOMs. A DRU has many of the same administrative and organizational responsibilities as a MAJCOM. (Example of a DRU: USAF Academy)

Enlisted Specialty Training (EST). A mix of formal training (technical school) and informal training (on-the-job) to qualify and upgrade airmen in each skill level of a specialty.

Exportable Training. Additional training via computer assisted, paper text, interactive video, or other necessary means to supplement training.

Field Operating Agency (FOA). FOAs are subdivisions of the Air Force directly subordinate to a Headquarters US Air Force functional manager. An FOA performs field activities beyond the scope of any of the MAJCOMs. The activities are specialized or associated with an Air Force-wide mission.

Go/No Go. In OJT, it is the stage at which an individual has/or has not gained enough skill, knowledge, and experience to perform a task without supervision.

Initial Skills Training. A formal school course that results in an AFSC 3-skill level award for enlisted or mandatory training for upgrade to qualified officers.

Instructional System Development (ISD). A deliberate and orderly (but flexible) process for planning, developing, implementing, and managing instructional systems. It ensures personnel are taught in a cost efficient way the knowledge, skills, and attitudes essential for successful job performance.

MAJCOM Functional Manager (MFM). Manager for all matters related to the training and utilization of individuals within a particular MAJCOM and AFSC. The MFM is appointed to oversee the technical aspects of an AFSC and provide management advice to directorates regarding maximum mission effectiveness, career progression, effective training, and processing temporary duty assistance requests.

Major Command (MAJCOM). A MAJCOM represents a major Air Force subdivision having a specific portion of the Air Force mission. Each MAJCOM is directly subordinate to HQ USAF. MAJCOMs are interrelated and complementary, providing offensive, defensive, and support elements.

Occupational Survey Report (OSR). A detailed report showing the results of an occupational survey of tasks performed within a particular AFSC.

On-the-Job Training (OJT). Hands-on, over-the-shoulder training conducted to certify personnel in both upgrade (skill level award) and job qualification (duty position certification) training.

Proficiency Training. Additional training, either in-residence or exportable advanced training courses, or on-the-job training, provided to personnel to increase their skills and knowledge beyond the minimum required for upgrade.

Qualification Training. Hands-on, task performance based training designed to qualify airmen in a specific duty position. This training program occurs both during and after the upgrade training process and is designed to provide skills training required to do the job.

Resource Constraints. Resource deficiencies (such as money, facilities, time, manpower, and equipment) that preclude desired training from being delivered.

Skill Training. A formal course that results in the award of a skill level.

Specialty Training Package and COMSEC Qualification Training Package. A composite of lesson plans, test material, instructions, policy, doctrine, and procedures necessary to conduct training. These packages are prepared by AETC, approved by National Security Agency (NSA), and administered by qualified communications security (COMSEC) maintenance personnel.

Specialty Training Standard (STS). An Air Force publication that describes an Air Force specialty in terms of tasks and knowledge that an airman in that specialty may be expected to perform or to know on the job. Also identifies the training provided to achieve a 3-, 5-, or 7-skill level within an enlisted AFS. It further serves as a contract between AETC and the functional user to show which of the overall training requirements for an Air Force Specialty Code (AFSC) are taught in formal schools and correspondence courses.

Standard. An exact value, a physical entity, or an abstract concept established and defined by authority, custom, or common consent to serve as a reference, model, or rule in measuring quantities or qualities, establishing practices or procedures, or evaluating results. It is a fixed quantity or quality.

Task Module (TM). A group of tasks performed together within an AFSC that requires common knowledge, skills, and abilities. TMs are identified by an identification code and a statement.

Total Force. All collective components (active, reserve, guard, and civilian elements) of the United States Air Force.

Training Capability. The capability of a training setting to provide training on specified requirements, based on the availability of resources.

Training Planning Team (TPT). Comprised of the same personnel as a U&TW, TPTs are more intimately involved in training development and the range of issues examined is greater than in the U&TW forum.

Training Requirements Analysis (TRA). A detailed analysis of tasks for a particular AFSC to be included in the training decision process.

Training Setting. The type of forum in which training is conducted (formal resident school, on-the-job, field training, mobile training team, self-study, etc.).

Training Business Area (TBA). An AF Portal-driven tool suite for managing, tracking, and documenting training activity. TBA formally replaces the web-based predecessor, Integrated Maintenance Data System, as the standard tool communicators use to track and manage training.

Upgrade Training. Mandatory training which leads to the award of a higher skill level.

Utilization and Training Pattern. A depiction of the training provided to and the jobs performed by personnel throughout their tenure within a career field or AFS. There are two types of patterns: 1) Current pattern, which

is based on the training provided to incumbents and the jobs to which they have been and are assigned; and 2) Alternate pattern, which considers proposed changes in manpower, personnel, and training policies.

Utilization and Training Workshop (U&TW). A forum of the AFCFM, MAJCOM functional managers, subject matter experts (SME) and AETC training personnel that determines career ladder training requirements.

Wartime Training Requirements. Those task that must be taught when courses are accelerated in a wartime environment. They are identified by an "*" in CFETP Part II, Section A, STS. In response to a wartime scenario, these tasks are taught in the 3-level course in a streamlined training environment. These tasks are only for those career fields that still need them applied to their schoolhouse tasks.

Section A - General Information

1. Purpose of the CFETP. This CFETP provides the information necessary for career field managers, training management, supervisors, and trainers to plan, develop, manage, and conduct an effective and efficient career field training program. The plan outlines the training that personnel should receive in order to develop and progress throughout their careers. For purposes of this plan, training is divided into three areas: initial skills, upgrade, and continuation training. Initial skills training is the AFS specific training an individual receives upon entry in the Air Force, normally conducted by AETC at one of the technical training centers. Upgrade training identifies the mandatory courses, task qualification requirements, and Career Development Course (CDC) completion required for award of the 5-, 7-, or 9-skill level. Continuation training is additional training provided to 3-, 5-, 7-, and 9-level personnel to increase their skills and knowledge beyond the minimum required for upgrade. The CFETP has several purposes, some of which are:

1.1. Serves as a management tool to plan, develop, manage, and conduct a career field training program. Also, ensures that established training is provided at the appropriate point in an individual's career.

1.2. Identifies task and knowledge training requirements for each skill level in the specialty and recommends training throughout each phase of an individual's career.

1.3. Lists training courses available in the specialty, identifies sources of the training, and provides the training medium.

1.4. Identifies major resource constraints that impact implementation of the desired career field training program.

2. Use of the CFETP. The CFETP is maintained by the Air Force Career Field Manager (AFCFM). MAJCOM Functional Managers and AETC review the plan annually to ensure currency and accuracy and forward recommended changes to the AFCFM. Using the list of courses in Part II, they determine whether duplicate training exists and take steps to eliminate/prevent duplicate efforts. Career field training managers at all levels use the plan to ensure a comprehensive and cohesive training program is available for each individual in the career ladder.

2.1. AETC training personnel develop/revise formal resident and exportable training based upon requirements established by the users and documented in the STS. They also develop procurement and acquisition strategies for obtaining resources needed to provide the identified training.

2.2. MAJCOM Functional Managers ensure their training programs complement the CFETP mandatory initial skill and upgrade requirements. They also identify the needed AFJQSs/AFQTPs to document unique upgrade and continuation training requirements. Requirements are satisfied through OJT, resident training, or exportable courseware/courses. MAJCOM developed training to support this AFSC must be identified for inclusion into this plan. Forward recommended changes to this CFETP to your MAJCOM Functional Manager.

2.3. 81 TRSS Qualification Training Flight (Q-Flight) personnel develop AFJQSs/AFQTPs based on requests submitted by the MAJCOMs and according to the priorities assigned by the Communications-Electronics (C-E) Maintenance Training Advisory Group (MATAG) Working Group.

2.4. Unit level training managers and supervisors manage and control progression through the career field by ensuring individuals complete the mandatory training requirements for upgrade specified in this plan and supplemented by their MAJCOM. The list of courses in Part II is used as a reference for planning continuation or career enhancement training.

3. Coordination and Approval of the CFETP. The AFCFM is the approval authority. MAJCOM representatives and AETC training personnel coordinate on the career field training requirements.

Section B - Career Field Progression and Information

4. Specialty Description. This information supplements that presented in AFECD (http://ask.afpc.randolph.af.mil/main_content.asp?prods1=1&prods2=14&prods3=591&prods4=1786&prods5=1795.

4.1. **Satellite, Wideband and Telemetry Systems Apprentice/Journeyman/Craftsman.**

4.1.1. Specialty Summary. Deploys, operates and sustains ground and space based satellite, Beyond Line-of-Sight (BLOS) wideband communications, telemetry, and instrumentation systems. Manages and performs design support, installation, calibration, testing, operation, maintenance, and repair of facilities, systems, equipment, and related subsystems. Monitors, analyzes, and directs performance checks and measurements to ensure acceptable performance. Configures equipment. Establishes and maintains communications links with distant terminals. Operates earth terminal control console, and monitors system performance indicators. Implements operational directives. Manages wideband and satellite earth terminal facilities or activities. Related DoD Occupational Subgroup 110000.

4.1.2. **Duties and Responsibilities:**

4.1.2.1. Manages satellite systems maintenance activities. Installs and checks operation of wideband and satellite earth terminal communications systems. Manages, installs and checks the operation of instrumentation and telemetry activities. Establishes performance and production standards and work methods. Determines extent and economy of repair for malfunctioning equipment. Recommends methods to improve equipment performance and maintenance procedures. Prepares reports related to operating, installing, repairing, maintaining, and evaluating equipment. Analyzes data printouts and recordings to determine marginal or faulty equipment operation. Evaluates justification and practicability, and recommends corrections to improve equipment performance or maintenance procedures. Assists agencies to conduct research and development projects associated with aerospace systems equipment. Assembles, programs, adjusts, and secures system components. Employs orbiting communication satellite, line-of-sight, and tropospheric scatter techniques. Conducts tests to restore and maintain systems. Uses anti-jam equipment and techniques to neutralize effects of communication jamming. Provides technical and design support assistance, solves problems for test site and operation, and maintenance functions. Develops and enforces safety rules.

4.1.2.2. Conducts periodic inspections of equipment and facilities to ensure compliance with technical data specifications and timely fulfillment of mission requirements. Interprets survey findings and prescribes corrective action. Serves on or directs inspection teams in evaluating equipment maintenance activities. Interprets deployment orders. Establishes communications links and interconnects communication facilities. Assembles, installs, and operates instrumentation and telemetry systems. Inspects completed assemblies during all phases of static and dynamic testing. Operates instrumentation and telemetry systems comprised of components such as transmitters, recorders, computers, and data conditioning and conversion equipment.

4.1.2.3. Operates and performs preventive and scheduled maintenance on equipment, to include repairs, overhauls, and modifications. Operates, inspects, adjusts, tunes, and aligns equipment for maximum operating efficiency. Controls preventive maintenance scheduling by coordinating with related control agencies. Evaluates and recommends changes to preventive maintenance routines to provide optimum operational availability and equipment condition. Refers to circuit and cable diagrams to trace circuits. Evaluates equipment performance using test equipment. Disassembles and repairs radar, television, airborne and ground analog and digital telemetry, laser, and timing device components, and other special equipment used for research and development projects. Analyzes equipment limitations, and modifies equipment to increase operational efficiency for specific missions. Reassembles components and calibrates, aligns, and adjusts completed assemblies. Accomplishes tolerance and specification tests. Records and repairs recurring malfunctions.

4.1.2.4. Manages, inspects, repairs and monitors equipment to determine performance, analyzes data and isolates malfunctions, detects deficiencies, replaces or repairs defective units, and performs corrective alignments. Performs and directs on-the-spot malfunction corrections. Tests repaired units. Removes, repairs, reassembles, reconnects, and performs operational checks. Restore systems to serviceable condition.

4.1.2.5. Installs and modifies equipment. Designs equipment modifications to meet mission needs. Implements modifications according to configuration directives. Assembles, connects, and inter-wires equipment. Uses layout drawings, schematics, logic diagrams, computer printouts, and technical data to determine installation configuration and analyze operating characteristics. Reviews, evaluates, and resolves deficiencies. Ensures maintenance data collection forms and inspection and maintenance records are completed and accurate.

4.1.3. Knowledge. Knowledge is mandatory of application and theory of electronics including solid state components and digital techniques, integrated circuits, transistors, microminiature components, fiberoptics, amplifiers, waveguide components, traveling wave tubes; principles of computers, networks, cryogenics, spread spectrum techniques, and satellite tracking; theory of instrumentation and telemetry systems; pulse and continuous modulation, synchros; servo drives; high power transmission systems and associated environmental control systems; space systems equipment operational procedures; data transmission; orbital mechanics; analog-to-digital and digital-to-analog conversion and hydraulics; data analysis; interpreting publications, blueprints and schematics; communications theory; principles of wideband and satellite earth terminal systems and equipment, and their operational procedures; satellite orbital mechanics; test equipment and circuit analysis; principles of multiplexing, digital data transmission; networks associated with multichannel equipment; installing and testing practices; atomic frequency generating devices; voice and data communication equipment including Defense Information Systems Agency technical and satellite control and testing procedures and interpretation of technical data; military specifications and standards; and Air Force maintenance management and supply procedures; application of mathematics, including algebraic formulas and physics to instrumentation and telemetry systems.

4.2. **Communications Systems Superintendent.**

4.2.1. **Specialty Summary.** Manages and directs communications systems maintenance facilities and resources. Included are functions of installing, maintaining, repairing, overhauling, deploying, and modifying. Systems and equipment include ground radar and radio, meteorological and navigation, combat camera, imagery, video, television, satellite, intrusion detection, space systems, telemetry, and microwave. Related DoD Occupational Subgroup: 110100.

4.2.2. **Duties and Responsibilities.** This specialty “caps” at the Senior Master Sergeant level with those personnel that came up through the 2E0XX and 2E1XX career fields. Therefore, the duties and responsibilities defined below encompass the complete spectrum of this specialty.

4.2.2.1. Plans and organizes maintenance activities. Prepares and analyzes reports encompassing siting, deploying, maintaining, installing, repairing, and removing communications systems, combat camera equipment, imagery systems, and related equipment. Included are ground radio equipment; navigation and meteorological systems; satellite and microwave communications systems; video, television studio, and intrusion detection systems; combat camera space systems, telemetry and instrumentation missions, and imagery systems. Coordinates activities and resolves common problems.

4.2.2.2. Directs maintenance activities. Checks systems and equipment for proper siting, installation, and serviceability. Directs personnel employed in siting, deploying, inspecting, adjusting, removing, replacing, and repairing communication systems and related equipment. Directs overhaul and repair of ground radar and communication systems, combat camera equipment, telemetry systems, imagery systems, and related equipment. Ensures work standards are maintained. Determines extent and economy of repair, including disposition of malfunctioning equipment.

4.2.2.3. Inspects and evaluates maintenance actions. Interprets findings and recommends or initiates corrective action. Serves on or directs inspection teams to evaluate maintenance activities. Discusses inspection findings. Maintains liaison with users to ensure adequate services are being provided.

4.2.2.4. Supervises maintenance functions. Resolves problems with installing, maintaining, repairing, and overhauling systems and equipment. Establishes local maintenance procedures and policies. Performs research and development of new systems and equipment.

4.3. **Communications-Electronics Chief Enlisted Manager**. This specialty "caps" at the Chief Master Sergeant Level with those specialties that came up through the 2E0XX, 2E1XX, 2E2XX, and 2E6XX career ladders. Personnel attaining the rank of Chief are assigned broad ranging duties in directing and managing diverse functions such as activities that install, remove, relocate, repair, and maintain radar systems (air traffic control and aircraft control and warning), telephone systems, satellite, wideband and telemetry systems, ground radio systems, meteorological and navigation systems, visual, imagery and intrusion detection systems, computer, network, switching and cryptographic, and antenna and cable systems. Other challenges that these Chiefs face are assignments to the White House Communications Agency, Air Force Element at CENTCOM, the Air Force Communications Agency, Defense Information Systems Agency, NATO, etc.

4.4. The following are some of the systems you may encounter as a 2E1X1.

SATELLITE SYSTEMS

AN/GSC-52 Medium Satellite Communications Terminal

AN/TSC-100A Tactical Satellite Communications Terminal

AN/PSC-11 Single Channel Anti-Jam Manportable Terminal (SCAMP)

AN/TSC-154 Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)

AN/TSC-168 (QHSAT)

AN/UMQ-13 MARK IVB Meteorological Data Station

WIDEBAND SYSTEMS

AN/TRC-170 Tropospheric Scatter Microwave Radio

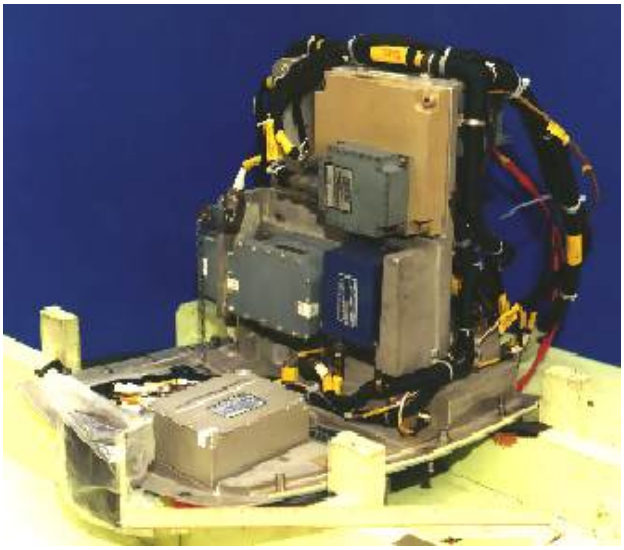
AN/GRC-239 Tropo Satellite Support Radio

TELEMETRY SYSTEMS

Telemetry Ground Support Facility

Telemetry Ground Station

Air Control Launch Missile Non-Tactical Instrumentation Kit



Minuteman Wafer

Peacekeeper Truss

Minuteman Test Launch

Starfire Optical Range

5. Skill/Career Progression. Adequate training and timely progression from the apprentice to superintendent skill levels play an important role in the Air Force's ability to accomplish its mission. It is essential that everyone involved in training do their part to plan, manage, and conduct an effective training program. The guidance provided in this part of the CFETP and the 2E1X1 Education and Training Path table will ensure individuals receive viable training at appropriate points in their careers.

Apprentice (3-Level) Training
Upon completion of initial skills training a trainee will work with a trainer to enhance their knowledge and skills.
Utilize CDCs, AFJQSs/AFQTPs, and other exportable courses to progress in the field.
Once task certified, a trainee may perform the task unsupervised.
Journeyman (5-Level) Training
Enter into continuation training to broaden experience base.
Five-levels may be assigned job positions such as team leader and shift supervisor.
Attend the Airman Leadership School (ALS) after serving 48 months in the Air Force or selection to rank of SSgt (active duty only). In-residence or correspondence course is required for Air National Guard/Air Force Reserve Command (ANG/AFRC) personnel.
Use CDCs and other references identified by the AFCFM to prepare for Weighted Airman Performance Systems (WAPS) testing.
Pursue academic education through CCAF and higher degree programs.
Craftsman (7-Level) Training
A seven-level can expect to fill various supervisory and management positions such as shift leader, team chief, supervisor, or task certifier.
Seven-levels should take courses or obtain added knowledge on management of resources and personnel and attend the 7-level resident course.
Pursue academic education through CCAF and other higher degree programs.
Attend the Noncommissioned Officer Academy (NCOA). In-residence or correspondence course is required for ANG/AFRC personnel.
Superintendent (9-Level) Training
A nine-level can be expected to fill positions such as flight chief, superintendents, and various staff positions.
Should pursue increased knowledge for budget, manpower, resources, and personnel management.
Pursue higher-level academic education and completion of courses outside of their AFS.
Chief Enlisted Manager (CEM) Training
Must be selected for CMSgt and possess qualifications in a feeder specialty (2E190 or 2E290).
CEMs work in a variety of similar jobs and functional areas where general managerial and supervisory abilities can be most effectively used and challenged.
Resident graduation of the USAF Senior NCO Academy (SNCOA) is a prerequisite for CMSgt sew-on (active duty only). In-residence or correspondence course required for ANG/AFRC personnel.
Resident graduation of the Chief Master Sergeant Leadership Course (CLC).

6. Training Decisions. This CFETP was developed to encapsulate an entire spectrum of training requirements for the Satellite, Wideband and Telemetry Systems career field, using a building block approach (simple to complex). Included in this spectrum was the strategy of when, where, and how to meet the training requirements. The strategy must be apparent and affordable to reduce duplication of training and eliminate a disjointed approach to training. The following decisions were made by members of the 23-27 January 2006 Utilization and Training Workshop.

6.1. Initial Skills. The workgroup reviewed the 3-level course. The schoolhouse introduced and recommended changes, as did the AFCFM and Subject Matter Experts. It was unanimously agreed by the workgroup the course is already on a great path and only minor enhancements were made to the 3-level STS. The biggest change was the removal of legacy SATCOM systems (TRC-170, TSC 100/94, TD-1234). The USC-60 and QH-SAT terminals will be the core training platforms.

6.1.1. A tactical SATCOM Air and Space Expeditionary Force (AEF) deployment exercise was created to enhance realism in training and better prepare 3-levels for deployments. During these blocks, the students are assigned to a UTC within an AEF bucket. The students will deploy and integrate all the systems taught to form a voice and data communications services between the in-garrison and expeditionary environments. It will give premium hands-on time that integrates the USC-60s, TSSRs, FCC-100s and Prominas. Implementation of this block is depended upon the SAF/XCIF and MAJCOMS providing the necessary mission equipment.

6.2. Five-Level Upgrade Requirements. Five-level training requirements were reviewed and updated with current information and standards.

6.2.1. CDC development will continue to be restricted to six volumes, although all 2E six volume CDC courses will be separated into two 3-volume courses. The first course (2EX5X) will contain the three core volumes. The second course will contain the three respective AFSC-specific volumes. The following table outlines 5-level CDC contents.

2EX5X	
VOLUME 1	Maintenance Management
VOLUME 2	Test Equipment
VOLUME 3	Communication Principles
2E151	
VOLUME 1	General Subjects
VOLUME 2	Missions and Systems Part I
VOLUME 3	Missions and Systems Part II

6.3. Seven-Level Upgrade Requirements. No 7-level CDCs are required for this AFSC. The 7-level CTG underwent minor updates to standardize training in core competencies of deployment concepts, system planning and implementation, and management principles.

6.4. Proficiency Training. This training is job qualification for an assigned duty position. Additional qualification training becomes necessary when personnel transfer to another duty position, the unit mission changes, a new personnel program comes on board, or any time changes in techniques or procedures occur.

6.5. Continuation Training. The purpose of the continuation training program is to provide additional advanced training, exceeding the minimum upgrade training requirements, with the emphasis on present and future duty positions. MAJCOMs may develop a continuation training program to ensure personnel individuals in the career field receive the necessary training at the appropriate points in their careers. The training program will identify both mandatory and optional training requirements.

6.5. Commercial Certifications. Below are some available commercial certifications for 2E1X1 technicians. An "X" in the DANTES column indicates that testing may be completed at the base education office. Tuition Assistance (TA) pays for only one certification during an entire career. See the local base education office for more information. The Department of Veterans Affairs (VA) has licensing and certification benefits that can be used, including the Montgomery GI Bill. Visit http://www.gibill.va.gov/GI_Bill_Info/benefits.htm for more information.

Certifications	Criteria	Website	DANTES
Electronics Technician Association (ETA) • Associate CET • Journeyman CET Competencies o Certified Satellite Installer ▪ Antenna Endorsement ▪ C & Ku Band Endorsement ▪ Commercial Endorsement ▪ SMATV Endorsement	• Experience • Written Exam	http://www.eta-i.org/	X
National Association of Radio and Telecommunications Engineers (NARTE) • Junior Telecommunications Tech • Senior Telecommunications Tech • Master Telecommunications Tech	• Education • Experience • References • Written Exam	http://www.narte.org	X

7. Community College of the Air Force (CCAF) Academic Programs. Enrollment in CCAF occurs upon completion of basic military training. CCAF provides the opportunity for all enlisted members to obtain an Associate in Applied Science degree. In order to be awarded the degree, all academic requirements must be completed before the student separates from the Air Force, retires, or is commissioned as an officer. CCAF offers the following associate degree program:

7.1. The Electronic Systems Technology (4VHP) program applies to 2EXXX career fields.

7.1.1. Degree Requirements: Individuals must hold the 5-skill level at the time of program completion.

	Semester hours
Technical Education	24
Leadership, Management, and Military Studies	6
Physical Education	4
General Education	15
Program Electives	15
Total	64

7.1.2. Technical Education (24 semester hours): A minimum of 12 semester hours of Technical Core subjects and courses must be applied and the remaining semester hours will be applied from Technical Core/Technical Elective subjects and courses.

7.1.3. Leadership, Management, and Military Studies (6 semester hours): Professional military education and/or civilian management courses. See CCAF General Catalog for application of civilian management courses.

7.1.4. Physical Education (4 semester hours): Satisfied upon completion of basic military training.

7.1.5. General Education (15 semester hours): Courses must meet the criteria for application of courses to the General Education requirement and be in agreement with the definitions of applicable General Education subjects/courses as outlined in the CCAF General Catalog.

7.1.6. Program Elective (15 semester hours): Satisfied with applicable Technical Education; Leadership, Management, and Military Studies; or General Education courses, including natural science courses meeting General Education requirement application criteria. Six semester hours of CCAF degree applicable technical credit otherwise not applicable to this program may be applied.

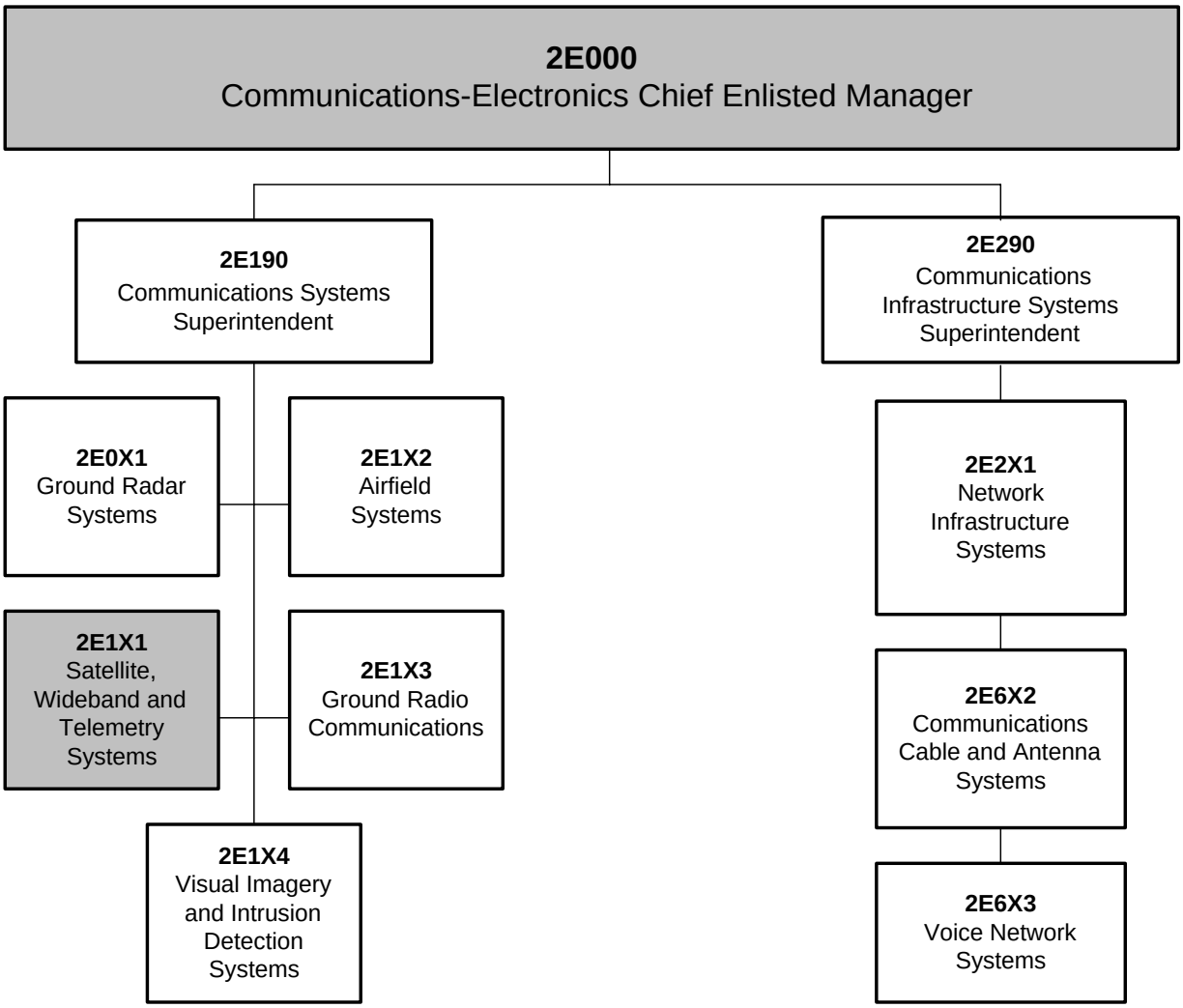
7.2. Occupational Instructor Certification. The College offers the Occupational Instructor Certification to instructors teaching full time in a CCAF affiliated school. To qualify, instructors must complete a 3 semester hour Instructor Methodology course, a 12 semester hour Teaching Internship, have two years teaching experience from date of Teaching Internship completion, hold an associate or higher degree, and be recommended by their commander/commandant.

7.3. See the current CCAF General Catalog for details regarding the Associates of Applied Science in Electronic Systems Technology. The catalog is available at your education officer or from http://www.au.af.mil/au/ccaf/.

7.4. Additional off-duty education is highly encouraged. Individuals desiring to become an AETC instructor should be actively pursuing an associate degree. A degreed faculty is necessary to maintain CCAF's accreditation through the Southern Association of Colleges and Schools.

8. Career Field Path. The following summarizes career progression and personnel allocations across the career ladder. 2E0X1, 2E1XX, 2E2X1, and 2E6XX personnel maintain their individual AFSC identifiers through the rank of MSgt. Upon promotion to SMSgt, AFSC 2E0X1, 2E1X1, 2E1X2, 2E1X3, and 2E1X4 merge to become a 2E190. Likewise, the 2E2X1, 2E6X2, and 2E6X3 merge to become the 2E290. At Chief Enlisted Manager, the 2E190 merges with 2E290 specialty to become a 2E000. Specific demographic information is available on the Web at http://wwa.afpc.randolph.af.mil/demographics/

2EXXX Career Field Progression



2E1X1 SATELLITE, WIDEBAND AND TELEMETRY SYSTEMS EDUCATION AND TRAINING PATH	
EDUCATION AND TRAINING REQUIREMENTS	AVERAGE SEW ON TIME AND COMMENTS
BASIC MILITARY TRAINING SCHOOL	
APPRENTICE TECHNICAL SCHOOL (3-SKILL LEVEL)	Airman..... 6 months
UPGRADE TO JOURNEYMAN (5-SKILL LEVEL) Minimum 15 months OJT training (9 months for retrainees). Completion of all 2E151 CTG core tasks and 5-Level CDCs.....Mandatory Specific AFJQSs/AFQTPs for equipment at assigned location. .....Mandatory Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties.....Mandatory AETC Supplemental training courses as determined by MAJCOM .....Optional Contract Field Service (CFS) and Special Maintenance Team (SMT) CFS/SMT training as determined by MAJCOM .....Optional	A1C ..... 10 months SrA ..... 3 years Earliest ..... 28 Months HYT ..... 12 years
AIRMAN LEADERSHIP SCHOOL (ALS) Attendance is limited to SSgt selectees or those attaining 48 months Total Active Federal Military Service (TAFMS) or who have been selected for promotion to SSgt. Completion is mandatory before assuming the rank of SSgt. ANG/AFRC may complete by correspondence course. .....Mandatory	TRAINER: Must meet trainer eligibility requirements set IAW AFI 36-2201 volume 3, chapter 6
UPGRADE TO CRAFTSMAN (7-SKILL LEVEL) Minimum rank of SSgt. 12 months OJT training (6 months for retrainees). Completion of all 2E171 CTG core tasks and AFQTP 2EXXX-201L, Communications-Electronics Work Center Manager's Handbook. Attendance at formal 7-level school. Must be 7-level to sew on TSgt. .....Mandatory Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties.....Mandatory AETC Supplemental training courses as determined by MAJCOM .....Optional AFCA seminars at Scott AFB. Consult your MAJCOM for course quotas.....Optional CFS/SMT training as determined by MAJCOM .....Optional	SSgt ..... 4.8 years Earliest ..... 3 years HYT ..... 20 years TSgt..... 10.6 years Earliest ..... 5 years HYT ..... 24 years CERTIFIER: Must meet certifier eligibility requirements set IAW AFI 36-2201 volume 3, chapter 6

2E1X1 SATELLITE, WIDEBAND AND TELEMETRY SYSTEMS EDUCATION AND TRAINING PATH	
EDUCATION AND TRAINING REQUIREMENTS	AVERAGE SEW ON TIME AND COMMENTS
NONCOMMISSIONED OFFICER ACADEMY (NCOA). Completion of course is mandatory before assuming the rank of MSgt. .....Mandatory Attendance duty attendance is limited to TSgt and TSgt selectees. ANG/AFRC SSgt or TSgt may attend in-residence or complete by correspondence course.	MSgt..... 16.7 years Earliest ..... 8 years HYT ..... 26 years
USAF SENIOR NONCOMMISSIONED OFFICER ACADEMY (SNCOA) Attendance is limited to SMSgt, SMSgt selectees, and selected MSgts. Completion is mandatory before assuming the rank of CMSgt. .....Mandatory SNCOA Correspondence Course .....Optional ANG/AFRC may complete by correspondence course. ANG/AFRC MSgts may attend in-residence.....Mandatory	SMSgt ..... 20.4 years Earliest ..... 11 years HYT ..... 28 years
UPGRADE TO SUPERINTENDENT (9-SKILL LEVEL) Minimum rank of SMSgt. Complete AFQTP 2EXXX-201LB, Communications-Electronics Manager's Handbook. .....Mandatory Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties. .....Mandatory	CMSgt ..... 22 years Earliest ..... 14 years HYT ..... 30 years
Chief Master Sergeant Leadership Course (CLC) Attendance is limited to Chief Master Sergeants and Chief Master Sergeant selects. ……..……Mandatory	CMSgt ..... 22 years Earliest ..... 14 years HYT ..... 30 years

NOTE 1: Published sew on times are AFSC averages from 2006. Refer to Enlisted Promotions at Air Force Personnel Center for more information: http://ask.afpc.randolph.af.mil/EProm/default.asp?prods3=5&prods2=2&prods1=1

NOTE 2: See Part II, Section D for a list of AFJQSs/AFQTPs, AETC supplemental, and CFS/SMT training.

NOTE 3: All core/duty position tasks must be completed prior to upgrade.

Section C - Skill Level Training Requirements

9. Purpose. The various skill levels in the career field are defined in terms of tasks and knowledge requirements for each skill level in the Satellite, Wideband and Telemetry Systems career field of the Communications-Electronics Systems career ladder. They are stated in broad, general terms and establish the standards of performance. An all encompassing core task list has not been developed for this specialty because of the diversity of the missions supported and the equipment installed to meet mission requirements. Core tasks, knowledge items, and skill requirements for this specialty are identified in the STS, CDCs, AFJQSs/AFQTPs, etc. Completion of the mandatory 3-level skill awarding course, CDCs, 7-level course, and applicable AFJQSs/AFQTPs define the Air Force core tasks for this specialty.

10. Specialty Qualification Requirements.

10.1. **Apprentice (3-Level) Training.**

KNOWLEDGE	Application and theory of electronics including solid state components and digital techniques, integrated circuits, transistors, micro-miniature components, fiber optics, amplifiers, waveguide components, traveling wave tubes; Principles of computers, networks, cryogenics, spread spectrum techniques, and satellite tracking; theory of instrumentation and telemetry systems; pulse and continuous modulation, synchros; servo drives; high power transmission systems and associated environmental control systems; Space systems equipment operational procedures; data transmission; orbital mechanics; analog-to-digital and digital-to-analog conversion and hydraulics; Data analysis; interpreting publications, blueprints and schematics; communications theory; principles of wideband and satellite earth terminal systems and equipment, and their operational procedures; satellite orbital mechanics; test equipment and circuit analysis; Principles of multiplexing, digital data transmission; networks associated with multi-channel equipment; installing and testing practices; atomic frequency generating devices; voice and data communication equipment including Defense Information Systems Agency technical and satellite control and testing procedures and interpretation of technical data; military specifications and standards; and Air Force maintenance management and supply procedures; Application of mathematics, including algebraic formulas and physics to instrumentation and telemetry systems
EDUCATION	Completion of high school with courses in geometry, trigonometry, algebra, and physics.
TRAINING	Electronics Principles, course E3AQR2E131 01AA PDS Code XQR) (See Attachment 1 of the STS for course training standard) Satellite, Wideband and Telemetry Systems Apprentice, course ECABP2E131 01AA (PDS Code ORL) (See Attachment 2 of the STS for course training standard)
EXPERIENCE	None required.

OTHER	Normal color vision is required for entry into this AFSC as defined by AFI 48-123, *Medical Examination and Standards*. Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into training is accomplished by reserving a position in the career field upon entry into the Air Force.

10.2. **Journeyman (5-Level) Training.**

KNOWLEDGE	No additional knowledge requirements.
TRAINING	No AETC training requirement.
EXPERIENCE	Qualification and possession of AFSC 2E131 Experience in functions such as analyzing, testing, calibrating, or maintaining satellite systems equipment, assembly, installation, repair, modification, and operation of instrumentation and telemetry systems; adjusting and calibrating instrumentation components; replacing defective parts or repairing faulty components; installing, maintaining, repairing, modifying or operating wideband and satellite earth terminal communications systems. Completion of the 2EX5X and 2E151 Career Development Course Completion of all 2E151 CTG core tasks (See Attachment 3 of the STS for career training guide) Completion of applicable equipment AFJQSs/AFQTPs Completion of all local tasks assigned for the duty position
OTHER	Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into formal upgrade is initiated upon assignment to the individual's first duty station. Qualification training is initiated anytime individuals are assigned duties for which they are not qualified. Use CDCs and AFJQSs/AFQTPs concurrently to obtain the necessary qualification for refresher and cross-utilization training.

10.3. **Craftsman (7-Level) Training.**

KNOWLEDGE	No additional knowledge requirements.
TRAINING	Communications-Electronics Career Advancement Course (In-residence), E3ACR2EX7X 01AA (PDS KOO)
EXPERIENCE	Qualification and possession of AFSC 2E151 Experience performing or supervising satellite systems maintenance, instrumentation and telemetry systems, or wideband and satellite earth terminal communications systems. Also, experience in performing or supervising functions such as: assembly, installation, repair, modification, and operation of instrumentation and telemetry systems; repairing test equipment; adjusting and calibrating instrumentation components; replacing defective parts; or repairing faulty components. Completion of all 2E171 CTG core tasks (See Attachment 4 of the STS for career training guide) Completion of AFQTP 2EXXXX-201L, Communications-Electronics Work Center Manager's Handbook Completion of applicable equipment/unit management function AFJQSs/AFQTPs
OTHER	Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into formal upgrade training is initiated when individuals obtain the necessary rank and skill level. Qualification training is initiated anytime an individual is assigned duties for which they are not qualified. Use CDCs and AFJQSs/AFQTPs concurrently to obtain the necessary qualification for refresher and cross-utilization training.

10.4. **Superintendent (9-Level) Training.**

KNOWLEDGE	Electronic principles theory and its application to ground radio, meteorological and navigation, combat camera, imagery, video, television, telemetry systems, space systems, intrusion detection, and satellite and microwave communications facilities, systems, and equipment; and their interoperability The communications and computer elements of a typical air base Interpretation of wiring and logic diagrams, blueprints, and technical orders
TRAINING	No AETC training requirement.
EXPERIENCE	Qualification and possession of AFSC 2E171 Experience is mandatory managing or directing functions such as installing, maintaining, repairing, or modifying the various systems and related equipment of the feeder specialties. AFQTP 2EXXXX-201LB, Communications-Electronics Manager's Handbook
OTHER	Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into OJT is initiated when individuals are selected for the rank of SMSgt. Qualification training is initiated anytime individuals are assigned duties for which they are not qualified.

10.5. Training Sources.

10.5.1. Electronic Principles training - 332 TRS, Keesler AFB, MS at https://wwwmil.keesler.af.mil/332trs/ep/index.htm

10.5.2. AFSC specific training - 338 TRS, Det. 1, Fort Gordon, GA at http://www.gordon.army.mil/338trsdet1/

10.5.3. 2EX7X Communications-Electronics Career Advancement course (7-Level School) – 338 TRS, Keesler AFB, MS at https://wwwmil.keesler.af.mil/338trs/special/7-level.htm

10.5.4. CDC 2E151 is available for upgrade purposes through the unit training manager. For individual qualification and cross-utilization training, CDCs are ordered through the unit training office.

10.5.5. AFJQSs/AFQTPs are Air Force publications and are mandatory for use in qualification training. They are developed by the 81 TRSS (Q-Flight), Keesler AFB, MS and may be downloaded from https://wwwmil.keesler.af.mil/81trss/qflight/index.htm. Procedures for requesting development of AFJQSs/AFQTPs are contained in AFI 36-2233 *Air Force On-the-Job Training Products for Communications-Electronics Enlisted Specialty Training*. AFJQSs/AFQTPs are listed in Part II, Section D, of this CFETP.

10.5.6. Contract Field Service (CFS), and Special Maintenance Team (SMT) training may be requested to provide on-site training. Direct requests for CFS, or SMT training to your MAJCOM.

Section D - Resource Constraints

11. Purpose. This section identifies known resource constraints that preclude optimal/desired training from being developed or conducted, including information such as part numbers, national stock numbers, number of units required, cost, manpower, etc. Included are narrative explanations of each resource constraint and an impact statement describing what effect each constraint has on training. Finally, this section includes actions required, OPR, and target completion date. Resource constraints will be, at a minimum, reviewed and updated annually.

12. Apprentice (3-Level) Training.

12.1. Constraints: None.

12.1.1. Impact. N/A

12.1.2. Resources Required. N/A

12.1.3. Action Required. N/A

12.2. OPR/Target Completion Date. N/A

13. Journeyman (5-Level) Training.

13.1. Constraints: None.

13.1.1. Impact. N/A

13.1.2. Resources Required. N/A

13.1.3. Action Required. N/A

13.2. OPR/Target Completion Date. N/A

14. Craftsman (7-Level) Training.

14.1. Constraints: None.

14.1.1. Impact. N/A

14.1.2. Resources Required. N/A

14.1.3. Action Required. N/A

14.2. OPR/Target Completion Date. N/A

Section E - Transition Training Guide

15. There are currently no transition training requirements. This area is reserved.

PART II

Section A - Specialty Training Standard

1. Implementation. The implementation of training in support of this STS is with the class beginning 20070502 and graduating 20070724.

2. Purpose. As prescribed in AFI 36-2201, Vol 5, this STS:

2.1. The Specialty Training Standards (STS) at Attachments 1 and 2:

2.1.1. Establishes the training requirements for airmen to perform 3-skill level duties in the Satellite, Wideband and Telemetry Systems career ladder of the Communications-Electronics Systems career field. The training tasks are based on an analysis of duties in AFECD for AFSC 2E131.

2.1.2. Provides the basis for the development of more detailed training materials, training objectives, and training evaluation instruments for the course.

2.1.3. Shows formal training requirements. Attachment 1 lists the Electronic Principles requirements for this specialty and contains the proficiency code key pertaining to this attachment. Students receive this training through AETC course E3AQR2E131 01AA.

2.1.4. Attachment 2 contains a list of behavioral statements that describe knowledge and job performance requirements the graduate demonstrates on the job as a result of training received in course ECABP2E131 01AA as described in the Air Force Education and Training Course Announcements (ETCA) database. Part I, Section D, and the Preface to Attachment 2 explains constraints and/or guidelines to training. When notes or explanations describe constraints in the skill awarding course, they indicate that training on those items is restricted due to the limitation described.

2.2. The Five-Level Career Training Guide (CTG) at Attachment 3:

2.2.1. Provides a complete list of continuation training requirements for the award of AFSC 2E151. Attachment 3 contains the behavioral code key used to indicate the type of training provided by CDCs.

2.2.2. Identifies the mandatory task and knowledge training that is required for the 5-skill level in the Satellite, Wideband and Telemetry Systems career field of the Communications-Electronic Systems career ladder. These are based on an analysis of duties and responsibilities as outlined in AFECD

2.3. The Seven-Level Career Training Guide (CTG) at Attachment 4:

2.3.1. Provides a complete list of continuation training requirements for the award of AFSC 2E171. Attachment 4 contains the behavioral code key used to indicate the type of training that will be provided.

2.3.2. Identifies the mandatory task and knowledge training that is required for the 7-skill level in the Satellite, Wideband and Telemetry Systems career ladder of the Communications-Electronics Systems career field. These are based on an analysis of duties and responsibilities as outlined in AFECD.

2.4. The CTGs at Attachments 3 and 4:

2.4.1. Provide OJT certification columns to record completion of task and knowledge training requirements. Use automated training management systems to document technician qualifications, if available. Task certification must show a start and stop date.

2.4.2. Become a job qualification standard for OJT when placed in AF Form 623, On-the-Job Training Record, and used according to AFI 36-2201, Vol 3.

2.4.3. Indicates career knowledge provided in the 5-skill level CDCs. See Air Force Institute for Advanced Distributed Learning (AFIADL) catalog maintained by the unit OJT manager for current CDC listings or go to http://www.maxwell.af.mil/au/afiadl.

2.4.4. Are guides for development of promotion tests used in the Weighted Airman Promotion System (WAPS). Specialty Knowledge Tests (SKT) are developed at the USAF Occupational Measurement Squadron by senior NCOs with extensive practical experience in their career fields. The tests sample

knowledge of CTG subject matter areas judged by test development team members to be most appropriate for promotion to higher grades. Questions are based upon study references listed in the WAPS catalog. Individual responsibilities are listed in chapter 1 of AFI 36-2605, *Air Force Military Personnel Testing System.* WAPS is not applicable to the Air National Guard or Air Reserve forces.

3. Recommendations. Comments and recommendations are invited concerning the quality of AETC training. A Customer Service Information Line (CSIL) has been installed for the supervisors' convenience. For a quick response to concerns, call our CSIL at DSN 736-2574, fax us at DSN 597-3790, or e-mail us at, 81trg-tget@keesler.af.mil. Reference this STS and identify the specific area of concern (paragraph, training standard element, etc).

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

MICHAEL W. PETERSON, Lieutenant General, USAF
Chief Warfighting Integration and Chief Information Officer

Attachments:
1. Electronic Principles Course Training Standard
2. Specialty Training Standard, 2E131
3. Five-Level Career Training Guide, 2E151
4. Seven-Level Career Training Guide, 2E171

PREFACE

NOTE 1: Dashed items in this CTS are not part of the original CTS created at the August 1999 Electronic Principles U&TW however, they are the specific objectives taught in the Electronic Principles course designed to meet the CTS requirements.

NOTE 2: Unless otherwise stated, students may be allowed two assists from the instructor and still successfully achieve the proper level of proficiency. An instructor assist is anytime an instructor must intercede to provide guidance to a student which leads to a satisfactory completion of the objective or to prevent the student from continuing in a manner that will lead to an unsatisfactory conclusion, safety violation, or damage to equipment.

NOTE 3: All objectives are trained during wartime.

PROFICIENCY CODE KEY		
	SCALE VALUE	DEFINITION: The individual
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED)
	2	Can do most parts of the task. Needs help only on hardest parts. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT)
***Task Knowledge Levels**	a	Can name parts, tools, and simple facts about the task. (NOMENCLATURE)
	b	Can determine step-by-step procedures for doing the task. (PROCEDURES)
	c	Can identify why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES)
	d	Can predict, isolate e, and resolve problems about the task. (COMPLETE THEORY)
****Subject Knowledge Levels**	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
	D	Can evaluate conditions and make proper decisions about the subject. (EVALUATION)

EXPLANATIONS

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Examples: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task or for a subject common to several tasks.

X This mark is used alone instead of a scale value to show that no proficiency training is provided in the course.

\- This mark is used alone in course columns to show that training is required, but not given, due to limitations in resources.

PROFICIENCY CODE

1. ELECTRONIC SUPPORT SUBJECTS.

1.1. Safety. B
- Identify safety precautions pertaining to electronics.

1.2. First Aid. A
- Identify first aid procedures for electrical injuries.

1.3. Electrostatic Discharge (ESD) Control. B
- Identify electrostatic discharge (ESD) sensitive device control methods.

1.4. Electromagnetic Effects (EMP/EMI). B
- Identify the techniques used to protect electronic equipment from the effects of electromagnetics (EMP/EMI).

1.5. Metric Notation.

1.5.1. Calculate Powers of Ten. 2b
- Convert decimal numbers to scientific notation and vice versa.
- Perform math operations of numbers expressed as scientific notation.

1.5.2. Electrical Prefixes. B
- Convert decimal numbers to electrical prefixes and vice versa.
- Convert electrical prefix values to other equivalent electrical prefix values.

2. USE TEST EQUIPMENT.

2.1. Analog Multimeter. 2b
- Identify procedures for analog multimeter usage.
- Identify the operating principles of the analog multimeter.
- Measure selected electrical values using analog and digital multimeters.

2.2. Digital Multimeter. 2b
- Identify procedures for digital multimeter usage.
- Identify the operating principles of the digital multimeter.
- Measure selected electrical values using analog and digital multimeters.

2.3. Oscilloscope. 2b
- Identify oscilloscope operating principles.
- Identify the procedures for oscilloscope usage.
- Measure selected electrical values using an oscilloscope and signal generator.

2.4. Signal Generator. 2b
- Identify the procedures for signal generator usage.
- Measure selected electrical values using an oscilloscope and signal generator.

PROFICIENCY CODE

3. BASIC CIRCUITS.

3.1. Direct Current (DC).

3.1.1. Theory. B
- Identify circuit schematic symbols.
- Identify basic circuit operating principles.
- Identify resistor voltage divider operating principles.
- Identify terms associated with direct current (DC) principles.
- Determine the results of parameter changes on DC resistive circuits.

3.1.2. Calculations. 2b
- Calculate values for a series resistive DC circuit diagram.
- Calculate values for a parallel resistive DC circuit diagram.
- Calculate values for a series-parallel resistive DC circuit diagram.

3.2. Alternating Current (AC).

3.2.1. Theory. B
- Identify terms associated with AC principles.

3.2.2. Calculations. 2b
- Calculate AC voltage values.
- Calculate AC frequency/time values.

4. BASIC CIRCUIT COMPONENTS.

4.1. Resistors.

4.1.1. Theory. B
- Identify resistor characteristics.

4.1.2. Color Code. B
- Using resistor color code, determine the ohm/tolerance value of resistors.

4.1.3. Troubleshoot. 2b
- Troubleshoot a series-parallel resistive circuit to a faulty resistor.

4.2. Inductors.

4.2.1. Theory. B
- Identify characteristics of inductors.
- Identify inductor DC operating principles.
- Identify inductor AC operating principles.

4.2.2. Troubleshoot. 2b
- Troubleshoot a faulty inductor in a circuit.

4.3. Capacitors.

PROFICENCY CODE

4.3.1. Theory. B
- Identify characteristics of capacitors.
- Identify capacitor DC operating principles.
- Identify capacitor AC operating principles.

4.3.2. Troubleshoot. 2b
- Troubleshoot a faulty capacitor in circuit.

4.4. Resistive-Capacitive-Inductive (RCL) Circuit Theory.

4.4.1. Basic. A
- Identify RCL circuit operating principles.

4.4.2. Resonant. A
- Identify resonant RCL circuit operating principles.

4.4.3. Frequency Sensitive Filter. A
- Identify frequency sensitive filter operating principles.

5. ELECTROMAGNETIC DEVICES.

5.1. Transformers.

5.1.1. Theory. B
- Identify characteristics of transformers.
- Identify transformer operating principles.

5.1.2. Troubleshoot. 2b
- Troubleshoot a faulty transformer.

5.2. Relays and Solenoids.

5.2.1. Theory. B
- Identify relay and solenoid operating principles.

5.2.2. Troubleshoot Relays. 2b
- Troubleshoot a faulty relay in a circuit.

5.3. Motor Theory.

5.3.1. Direct Current. A
- Identify DC motor operating principles.

5.3.2. Alternating Current. A
- Identify AC motor operating principles.

	PROFICIENCY CODE
5.4. Generator Theory.	
5.4.1. Direct Current. – Identify DC generator operating principles.	A
5.4.2. Alternating Current. – Identify AC generator operating principles.	A
5.5. Synchro/Servo	
5.5.1. Theory. – Identify servo/synchro operating principles.	A
5.5.2. Theoretical Troubleshooting. – Identify servo/synchro fault isolation procedures.	-
5.6. Transducer Theory. – Identify transducer operating principles.	B
6. SOLID STATE DEVICES.	
6.1. Diodes.	
6.1.1. Theory. – Identify solid-state diode operating principles.	B
6.1.2. Troubleshoot. – Identify diode fault isolation techniques. – Troubleshoot a diode circuit.	2b
6.2. Bipolar Junction Transistors.	
6.2.1. Theory. – Identify bipolar transistor operating principles.	B
6.2.2. Troubleshoot. – Troubleshoot a bipolar junction transistor circuit.	2b
6.3. Special Purpose Device Theory.	
6.3.1. Zener Diode. – Identify zener diode operating principles.	B
6.3.2. Light Emitting Diode (LED). – Identify LED operating principles.	A
6.3.3. Liquid Crystal Display (LCD). – Identify LCD operating principles.	A

	PROFICIENCY CODE
6.3.4. Integrated Circuits (IC). – Identify integrated circuit (IC) operating principles.	A
6.3.5. Field Effect Transistor (FET). – Identify MOSFET operating principles.	-
6.3.6. Operational Amplifiers. – Identify OP AMP operating principles.	A
7. TRANSISTOR AMPLIFIER CIRCUITS.	
7.1. Theory. – Identify the transistor amplifier configurations. – Identify common base amplifier operating principles. – Identify common emitter amplifier operating principles. – Identify common collector amplifier operating principles.	B
7.2. Stabilization. – Identify transistor amplifier temperature stabilization operating principles.	B
7.3. Coupling. – Identify coupling circuit operating principles.	B
8. POWER SUPPLY CIRCUITS.	
8.1. Theory.	
8.1.1. Rectifiers. – Identify power supply rectifier operating principles.	B
8.1.2. Filters. – Identify power supply filter operating principles.	B
8.1.3. Voltage Regulators. – Identify shunt regulator operating principles. – Identify series electronic voltage regulator (EVR) operating principles.	B
8.2. Troubleshoot. – Identify types of malfunctions in a filtered power supply circuit. – Troubleshoot a filtered power supply circuit to a faulty component. – Troubleshoot a series EVR circuit to a faulty component.	2b

PROFICIENCY CODE

9. WAVE GENERATING CIRCUITS.

9.1. Theory.

9.1.1. Oscillators. B
- Identify LC oscillator operating principles.
- Identify crystal oscillator operating principles.
- Identify the characteristics of oscillator circuits.

9.1.2. Multivibrators. B
- Identify astable multivibrator operating principles.
- Identify bistable multivibrator operating principles.
- Identify monostable multivibrator operating principles.

9.1.3. Waveshaping Circuits. B
- Identify sawtooth generator operating principles.
- Identify RC integrating/differentiating circuit operating principles.

10. DIGITAL NUMBERING SYSTEMS.

10.1. Conversions.

10.1.1. Binary. B
- Identify principles of binary conversions.

10.1.2. Octal. -
- Identify principles of octal conversions.

10.1.3. Hexadecimal. B
- Identify principles of hexadecimal conversions.

10.1.4. Binary Coded Decimal. B
- Identify principles of binary coded decimal (BCD) conversions.

10.2. Binary Math Operations. 2b
- Determine the results of math operations.

11. DIGITAL LOGIC CIRCUITS.

11.1. Theory.

11.1.1. Gates. B
- Identify principles of logic gate operation.

11.1.2. Flip-Flops. B
- Identify principles of flip-flop operation.

	PROFICIENCY CODE
11.1.3. Combination Logic Circuits – Identify operating principles of combinational logic circuits.	-
11.1.3.1. Theoretical Troubleshooting – Troubleshoot a combinational logic circuit.	-
11.2. Digital-to-Analog (D/A) and Analog-to-Digital (A/D) Converter Theory. – Identify operating principles of a digital-to-analog (D/A) converters. – Identify operating principles of analog-to-digital (A/D) converters.	B
12. BASIC COMPUTER FUNDAMENTALS.	
12.1. Network Theory.	
12.1.1. Components. – Identify basic network hardware component operating principles.	A
12.1.2. Types. – Identify basic network communication system types.	A
12.1.3. Topologies. – Identify basic network physical topologies.	B
12.1.4. Communications Mediums	B
12.1.5. LAN Architecture – Identify network medium operating principles.	B
13. BASIC COMMUNICATIONS THEORY.	
13.1. Antenna. – Identify antenna operating principles.	B
13.2. Transmission Lines. – Identify transmission line theory of operation.	B
13.2.1. Data Bus.	B
13.3. Waveguides. – Identify waveguide operating principles.	B
13.4. Transmitters.	
13.4.1. Amplitude Modulation (AM). – Identify AM transmitter operating principles.	B
13.4.2. Frequency Modulation (FM). – Identify FM transmitter operating principles.	B
13.5. Receivers.	
13.5.1. Amplitude Modulation (AM).	B

PROFICIENCY CODE

- Identify AM receiver operating principles.

13.5.1.1. AM Receiver Signals

13.5.1.2. Measure Radio Frequency (RF) 1a

13.5.1.3. Measure Intermediate Frequency (IF) 1a

13.5.1.4. Measure Audio Frequency (AF) 1a

13.5.1.5. Measure Local Oscillator (LO) Output 1a

13.5.2. Frequency Modulation (FM). B
- Identify FM receiver operating principles.

14. SOLDER AND DESOLDER.

14.1. Terminal Connection. -
- Solder a wire to a terminal connector.
- Desolder a wire from a terminal connector.

14.2. Printed Circuit Board (PCB). -
- Solder three components to a PCB.
- Desolder three components from a PCB.

14.3. Multipin Connector. -
- Solder a tinned wire into a pin for use in a multipin connector.
- Desolder a wire from a pin used in a multipin connector.

14.4. Coaxial Connector. -
- Solder a coaxial connector center contact to a coaxial cable.
- Desolder a coaxial connector center contact from a coaxial cable.

15. ASSEMBLE SOLDERLESS CONNECTORS.

15.1. Crimped Connection. -
- Splice two wires together using a crimp connector.
- Crimp a terminal lug to a wire.

15.2. Coaxial Connector. -
- Assemble a solderless coaxial cable connector to a coaxial cable.

15.3. Multipin Connector. -
- Crimp a wire into a pin for use in a multipin connector.

Assemble a multipin connector.

PREFACE

NOTE 1: In the event of data network or computer system failures, courses are authorized to use alternative methods of instruction to fulfill this STS element.

NOTE 2: Unless otherwise stated in the objective, the student may be allowed two assists from the instructor and still successfully achieve the proper level of proficiency. An instructor assist is defined as anytime an instructor must intercede to provide guidance to a student which leads to a satisfactory completion of the objective or to prevent a student from continuing in a manner which will lead to an unsatisfactory conclusion, safety violation, or damage to the equipment. Successful students have performed the task to the satisfaction of the course; however, they may not be capable of meeting the field requirements for speed or accuracy.

NOTE 3: All equipment related objectives are performed by following procedures from technical orders, technical manuals, or student instructional material developed by the training facility. Test equipment used throughout the course includes:

Multimeter
Power Meter
Signal\Sweep Generator
Spectrum Analyzer
Frequency Counter
Attenuators
Bit Error Rate Test Set
Built-in Test Equipment
Oscilloscope

NOTE 4: The equipment items identified below are used as training vehicles within the skill awarding course since it incorporates most of the basic principles and procedures found in the remainder of the AFSC's equipment inventory.

AN/USC-60A
TDC Crypto module
TDC RF Module
Network Bandwidth Management Equipment (Promina)
AN/FCC-100
TROPO Satellite Support Radio

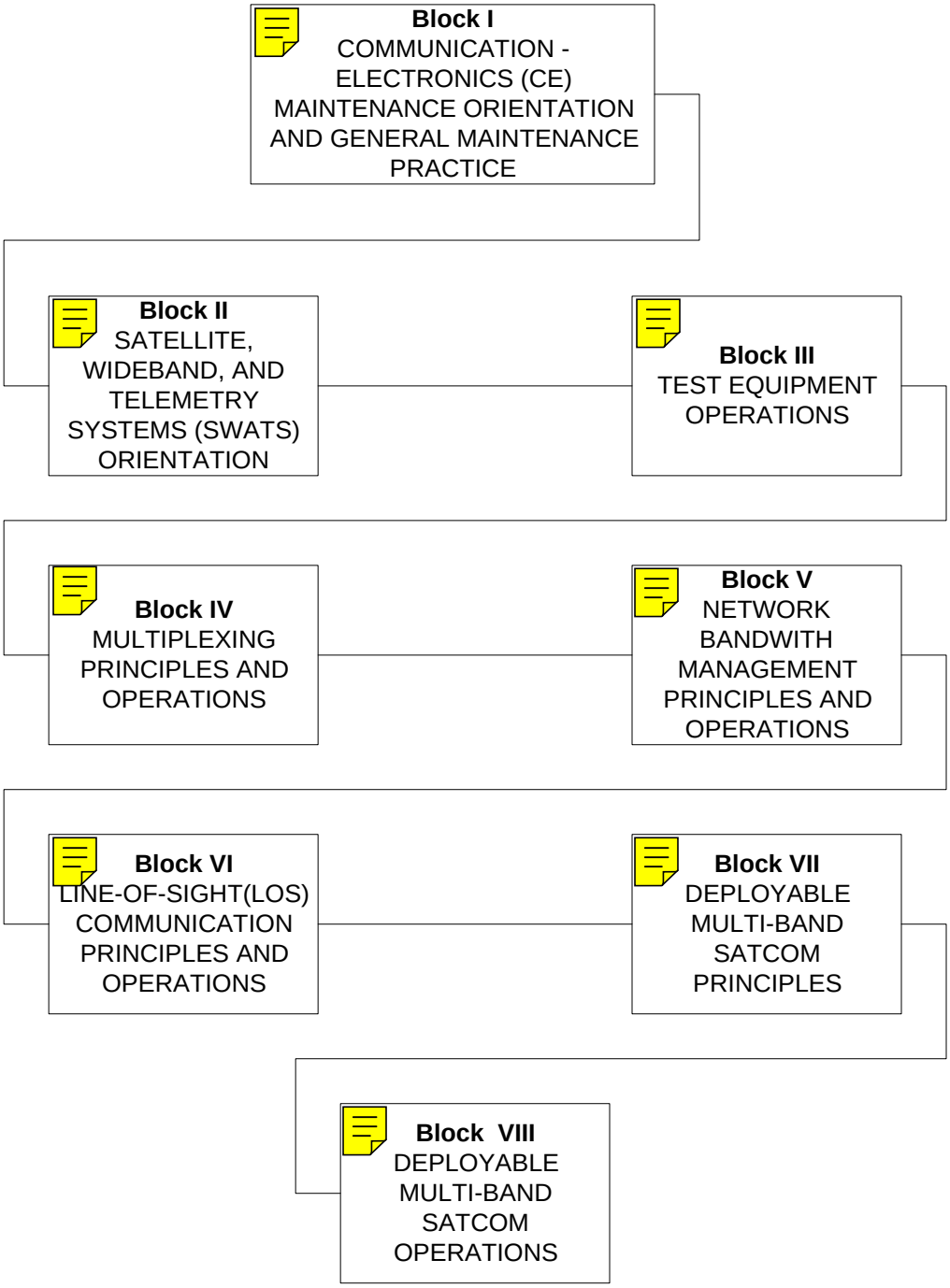
NOTE 5: All objective references are performed as terminal objectives. Knowledge required to perform CTS elements is inherent in each objective. This includes, but is not limited to, defining the capabilities, limitations, and theory of operation of the stated item.

NOTE 6: All objectives preceded by an “*” are trained during wartime.

Satellite, Wideband and Telemetry Communications Systems

(ECABP2E131 01AA)

The following summarizes the systems and concepts taught in the Satellite, Wideband and Telemetry Communications Systems Apprentice course. This course provides the knowledge and skills necessary for entry into formal upgrade training. To view block information select note icon on the flowchart. This information may vary from the current course content. Contact the course training manager for possible changes.



1. GENERAL PRINCIPLES.

1.1. Describe the 2E1X1 career field.

1.2. Identify major systems.

2. OPERATIONAL RISK MANAGEMENT (ORM) AND SAFETY.

2.1. Identify the purpose of ORM.

2.2. Identify the purpose of AFOSH.

2.3. Practice safety precautions during maintenance actions.

2.4. Practice safety precautions when working with energized equipment.

2.5. Identify common safety hazards of the 2E1X1 career field.

3. SECURITY.

3.1. Identify security classifications.

3.2. Identify general security concerns.

4. STANDARD MAINTENANCE PRACTICES.

4.1. Identify basic troubleshooting techniques.

4.2. Identify the concepts of grounding.

4.3. Identify the concepts of bonding.

4.4. Identify the concepts of shielding.

4.5. Identify the principles of Electro Static Discharge (ESD).

4.6. Identify the principles of lightning protection.

4.7. Locate elements such as unit, module, row, column, component pin, connector, or test point using an alphanumeric designator.

4.8. Perform a visual inspection of equipment.

5. TECHNICAL DATA.

5.1. Identify basic facts of technical publications.

5.2. Use specific equipment publications when performing maintenance actions.

6. MAINTENANCE MANAGEMENT.

6.1. Identify the purpose of preventive maintenance inspections.

6.2. Identify the purpose of equipment status reporting.

6.3. Identify the purpose of documenting maintenance data.

6.4. Input maintenance data using an automated maintenance data collection system. (NOTE 1)

7. LOGISTICS SUPPORT.

7.1. Identify the purpose of logistics support.

7.2. Locate parts information.

8. TEST EQUIPMENT.

8.1. Operate test equipment.

9. AEF CONCEPTS.

9.1. Identify basic concepts of the AEF and UTC deployment process.

9.2. Describe pre-deployment procedures for tactical wideband/SATCOM systems.

9.3. Describe capabilities and limitations of deployment by surface and air transport for ground tactical wideband/SATCOM systems.

***10. DIGITAL MULTIPLEXING**

10.1. Describe the concept of multiplexing.

10.2. Identify principles, capabilities and limitations of timing and synchronization.

10.3. Identify principles, capabilities and limitations of time division multiplexer (TDM) equipment.

10.4. Perform an operational check on the AN/FCC-100 TDM.

10.5. Configure the AN/FCC-100 TDM.

10.6. Troubleshoot the AN/FCC-100 TDM to the faulty LRU.

***11. NETWORK BANDWIDTH MANAGEMENT EQUIPMENT**

11.1. Identify principles, capabilities and limitations of network transport infrastructures.

11.2. Identify principles, capabilities and limitations of the Promina.

11.3. Configure a Promina.

11.4. Perform an operational check on a Promina.

11.5. Identify principles, capabilities and limitations of the Theater Deployable Communications (TDC) Crypto Module.

11.6. Configure the TDE Crypto module.

11.7. Perform an operational check of the TDC Crypto module.

***12. LINE-OF-SIGHT (LOS) COMMUNICATION EQUIPMENT**

12.1. Identify principles, capabilities and limitations of modulation methods.

12.2. Describe basic wideband radio principles.

12.3. Identify principles, capabilities and limitations of a LOS system.

12.4. Identify Troposcatter Satellite Support Radio (TSSR) operating principles.

12.5. Run performance check on the AN/GRC-239 TSSR

12.6. Configure the AN/GRC-239 TSSR.

12.7. Identify operating principles of the TDC RF module.

12.8. Performance check the TDC RF module.

12.9. Configure the TDC RF module.

***13. DEPLOYABLE MULTIBAND SYSTEMS**

13.1. Identify principles, capabilities and limitations of deployable multi-band satellite terminals.

13.2. Identify principles, capabilities and limitations of operating a Hub\Spoke and meshed network.

13.3. Identify principles, capabilities and limitations of the antenna systems for deployable multi-band satellite terminals.

13.4. Identify principles, capabilities and limitations of the power distribution system for deployable

multi-band satellite terminals.

13.5. Describe satellite control and reach-back coordination process.

13.6. Identify principles, capabilities and limitations of the Control, Monitor and Alarm system for deployable multi-band satellite terminals.

13.7. Perform power up/down procedures on the multi-band Spoke satellite terminal.

13.8. Configure the baseband equipment on the multi-band Spoke satellite terminal.

13.9. Perform an operational check on the baseband equipment in the multi-band Spoke satellite terminal.

13.10. Configure the transmit/receive equipment in the multi-band Spoke satellite terminal.

13.11. Perform an operational check on the transmit/receive equipment in the multi-band Spoke satellite terminal.

13.12. Configure the antenna system for the multi-band Spoke satellite terminal.

13.13. Configure Control, Monitor and Alarm system in the multi-band Spoke.

13.14. Perform interface of external multiplexing equipment with a multi-band Spoke satellite terminal.

13.15. Perform power up/down procedures on a multi-band Hub satellite terminal.

13.16. Configure the baseband equipment on the multi-band Hub satellite terminal.

13.17. Perform an operational check on the baseband equipment in the multi-band Hub satellite terminal.

13.18. Configure the transmit/receive equipment in the multi-band Hub satellite terminal.

13.19. Perform an operational check on the transmit/receive equipment in the multi-band Hub satellite terminal.

13.20. Configure the antenna system for the multi-band Hub satellite terminal.

13.21. Configure Control, Monitor and Alarm system in the multi-band Hub.

13.22. Perform interface of external multiplexing equipment with the multi-band Hub satellite terminal.

***14. EXPEDITIONARY COMMUNICATIONS.**

Note: In the event of inclement weather or unforeseen circumstances, course is authorized to use alternative methods of instruction to fulfill these STS elements.

14.1. Describe the Air Expeditionary Force Concept.

14.2. Describe the elements of Satellite and Wideband communications systems Unit Type Code concepts

14.3. Establish voice and data communication services using the following deployable systems:

14.3.1. SATCOM terminals.

14.3.2. LOS radios.

14.3.3. Network bandwidth management equipment.

14.3.4. Digital multiplexing equipment.

14.3.5. End user equipment (telephone or computer).

BEHAVIORAL FORMAT CTG CODING SYSTEM

Each CTG element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided.

Code	Definition
A	Subject Knowledge Level - Can identify basic facts and terms about the subject. (FACTS)
B	Subject Knowledge Level - Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES)
C	Subject Knowledge Level - Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
D	Subject Knowledge Level - Can evaluate conditions and make proper decisions about the subject. (EVALUATION)
-	When this code is used in the OJT Upgrade Column it indicates that the certification or qualification on this task is a local determination. When this code is used in the CDC Column it indicates that no training for this subject is provided in the CDCs.
X	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level. This code indicates that training to satisfy this requirement is either provided through OJT, CBTs and CDCs, or a combination of OJT, CBTs, and CDCs.
X*	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level if the assigned duty position is responsible to maintain/operate the equipment or system indicated as assigned by the local work center supervisor. This code indicates that training to satisfy this requirement is normally provided through OJT.

CDC column. The use of proficiency coding indicates the level of knowledge training provided by the CDCs, The CDC column will now identify the subject knowledge level covered in the CDC. The “K” will no longer be used to identify the knowledge covered in the CDC. Information pertaining to the meaning of the code can be located in the CTG coding system table.

CFETP versus AFJQS task coding. AFJQSs/AFQTPs annotated in the CFETP with an “X” denotes the AFJQS is mandatory. Within the AFJQS are individual tasks that are coded either “X” or “X*”. If the tasks are coded “X,” they are mandatory. If coded “X*,” they are duty position specific.

The identification blocks listed below are to be used to list all personnel authorized to sign off tasks in Part II of the CFETP, including automated CFETP's as per AFI 36-2201, Vol 3.

THIS BLOCK IS FOR IDENTIFICATION PURPOSES ONLY Personal Data - Privacy Act of 1974		
PRINTED NAME OF TRAINEE *(Last, First, Middle Initial)*	INITIALS *(Written)*	SSAN
PRINTED NAME OF TRAINER AND WRITTEN INITIALS		
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	

PREFACE

NOTE 1: Users are responsible for annotating technical references to identify current references pending STS revision. Locate current publications at.

DOD Issuances and OSD Administrative Instructions at http://www.dtic.mil/whs/directives/
Air Force publications at http://www.e-publishing.af.mil/.
AFSSIs at https://private.afca.af.mil/ip/
AFIND 5, DISA Circulars and Instructions at https://edge.disa.mil/ca/pubs/
Technical Orders (TO) at https://www.toindex-s.wpafb.af.mil/
Online ReferenceWare and CBTs: https://www.my.af.mil/faf/FAF/fafHome.jsp (Select "IT E-Learning" link under *Top Viewed: Training*)

NOTE 2: AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training is mandatory for use in conjunction with this CTG. It sets the Air Force standard for qualification and certification for the following subject areas:

Supply
Training
Supervision
Physical Security
Electronic Warfare
Information Security
Emission Security (EMSEC)
Work Center Administration
Operational Risk Management
Communications Security (COMSEC)
C-E Equipment Maintenance Management
Operator Care of Assigned Government Vehicles
Technical Orders (TO) and Technical Publications
Protect MAJCOM/FOA Critical Mission Information
C-E Equipment Maintenance System Inspecting, Reporting, and Forms
Air and Space Expeditionary Force (AEF) Concept of Operations (CONOPS)

NOTE 3: Equipment/system knowledge and/or performance tasks are defined in the AFJQS. AFJQS items set the standard for qualification and certification and are mandatory for use in conjunction with this CTG. AFQTPs listed in the CTG are generally handbooks that do not have task listings, therefore tracking through the Integrated Maintenance Data System is not possible. Annotate completion of these products on AF Form 623A.

NOTE 4: When an AFJQS is loaded into IMDS, letters in the AFJQS identifier are converted to the number representing each letter's alphabetical position (e.g., 200B would be loaded as 200.2). To save space, individual AFJQS tasks are not normally listed within the CTG. However, if a CTG task is closely related to an AFJQS task or area, the AFJQS task/heading is listed (e.g., 200.2.12) and the related CTG task is listed under it (e.g., 200.2.12.75). To prevent potential task numbering conflicts between AFJQS tasks and subordinate CTG tasks, subordinate CTG tasks start with the number 75. This creates gaps in the final task numbering sequence, but integrates related CTG and AFJQS tasks so they will be listed on your training documents in the same area and in order.

NOTE 5: When loading AFJQS tasks into the IMDS database, tasks are loaded as STS not 797 items.

NOTE 6: Upon base specific implementation of TBA, all members requiring training records will transition from documenting training of this CFETP, associated AFJQSs and AFQTPs from IMDS to TBA.

NOTE 7: AFQTPs listed in the CTG are generally handbooks that do not have specific task listings, the QTPs themselves are identified as tasks in TBA to allow for automated tracking. Annotate completion of these products in TBA and on AF Form 623A.

NOTE 4: When an AFJQS is loaded into TBA, the AFJQS identifier is displayed in the task statement (e.g., AFJQS-2EXXX-200B-001.001). When loaded to TBA, AFJQS task numbering will vary from the CTG. The numbering scheme is defined by your work center specific master training plan.

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
1. COMMUNICATIONS-ELECTRONICS (C-E) AFECD, 2E1X1 CFETP, Part I							
1.1. Explain the duties, responsibilities and progression in assigned Air Force Specialty (AFS)	X	A					
1.2. Read CFETP 2E1X1, Part I.	X	-					
2. MAINTENANCE MANAGEMENT OF C-E SYSTEMS TR: AFI 21-116, AFI 36-2201, Vol 3							
2.1. State facts related to the following Maintenance Management Policies	-	-					
2.1.1. Equipment Readiness	-	A					
2.1.2. Maintenance Staffing and Utilization	-	A					
2.1.3. Maintenance Training	-	A					
2.1.4. Communications Standardization and Evaluation Program (CSEP)	-	A					
2.1.5. Maintenance Information Systems (MIS)	-	A					
2.2. Assigned Maintenance Responsibilities	-	A					
2.3. Categories Of Maintenance Organizations	-	A					
2.4. Maintenance Operations Center (MOC)	-	A					
2.5. Quality Assurance (QA)	-	A					
2.6. Materiel Control	-	A					
2.7. Maintenance Production Work Centers	-	A					
2.8. Deployed Maintenance Management	-	A					
2.9. Logistics Support	-	A					
3. TEST EQUIPMENT. TR: TO 33K-1-100, Applicable test equipment technical orders							
3.1. Identify principles, capabilities, and limitations of the following test equipment items:							
3.1.1. Analog oscilloscope.	-	A					
3.1.2. Digital oscilloscope.	-	A					
3.1.3. Spectrum analyzer.	-	A					
3.1.4. Analog multimeter.	-	A					
3.1.5. Digital multimeter.	-	A					
3.1.6. Power meter.	-	A					
3.1.7. Optical time domain reflectometer.	-	A					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
3.1.8. Time domain reflectometer.	-	A					
3.1.9. Bit error rate test set.	-	A					
3.1.10. RF signal generator.	-	A					
3.1.11. Frequency counter.	-	A					
3.1.12. Insulation test set.	-	A					
3.2. Perform equipment maintenance using the following common test equipment items.							
3.2.1. Analog oscilloscope.	X*	-					
3.2.2. Digital oscilloscope.	X*	-					
3.2.3. Spectrum analyzer.	X*	-					
3.2.4. Analog multimeter.	X*	-					
3.2.5. Digital multimeter.	X*	-					
3.2.6. Power meter.	X*	-					
3.2.7. Optical time domain reflectometer.	X*	-					
3.2.8. Time domain reflectometer.	X*	-					
3.2.9. Bit error rate test set.	X*	-					
3.2.10. RF signal generator.	X*	-					
3.2.11. Frequency counter.	X*	-					
3.2.12. Insulation test set.	X*	-					
4. STANDARD MAINTENANCE PRACTICES. TR: TOs 00-25-234, 31-10-7, 31-10-11, 31-10-13, 31-10-24, 31W-1-102, 31-141-1 volume 1, 31W2-4-330 series, and 31W3-10-20, TIA/EIA-568A & 569; AFI 32-1065, AFJQS 2EXXX-202B, MIL-STD 2000A, American Public Works Association Policy and American National Standard Institute Standard (ANSI) Z53.1							
4.1. State facts related to the following practices:							
4.1.1. Installation.	-	A					
4.1.2. Configuration.	-	A					
4.1.3. Interconnection.	-	A					
4.1.4. Inspection.	-	A					
4.2. Describe the requirements for marking and identifying underground utilities	-	A					
4.3. Describe EMSEC suppression techniques.	-	A					
4.4. Describe the importance of cable labeling and installation documentation.	-	A					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
4.5. Describe wire color-coding standards.	-	A					
4.6. Describe fiber optics installation concepts.	-	A					
4.7. Describe the concepts of:							
4.7.1. Grounding.	-	A					
4.7.2. Bonding.	-	A					
4.7.3. Shielding.	-	A					
4.7.4. Lightning protection.	-	A					
4.8. Remove or install equipment grounds.	X*	-					
4.9. Check quality of equipment grounds.	X*	-					
4.10. Check quality of lightning protection system.	X*	-					
5. COMMUNICATIONS PRINCIPLES. TR: TO 31-1-141 Series							
5.1. State facts relating to the following:							
5.1.1. Amplitude Modulation (AM).	-	A					
5.1.2. Frequency Modulation (FM).	-	A					
5.1.3. Phase Modulation (PM).	-	A					
5.1.4. Pulse Code Modulation (PCM).	-	A					
5.1.5. Bandwidth.	-	A					
5.1.6. Lightwave communications.	-	A					
5.1.7. Asynchronous/synchronous communication modes.	-	A					
5.1.8. Error detection and correction.	-	A					
6. AIR FORCE COMPUTER BASED TRAINING (Note 1) TR: https://www.my.af.mil/faf/FAF/fafHome.jsp (Under "My EDP"							
6.1. Introduction to Telecommunications (72111_ENG)	X	-					
6.2. Introduction to Signals and Signal Transmission (84650_ENG)	X	-					
6.3. Introduction to Communications Methods and Equipment (110725_ENG)	X	-					
6.4. Networking Essentials (31843_ENG)	X	-					
6.5. Create Your Time and Memory Management Program (PD0124 ENG)	X	-					
6.1.6. Introduction to WAN Technologies (110726_eng)	X	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
7. EXPEDITIONARY COMMUNICATIONS CONCEPTS. TR: https://aefcenter.afpc.randolph.af.mil/							
7.1. Identify basic concepts of the Air and Space Expeditionary Force (AEF) deployment process. TR: AFI 10-400, Chap 1 thru 3	X	A					
7.2. Explain basic concepts of Unit Type Codes (UTC) and Force Packaging as it relates to the AEF tasking process. TR: AFMAN 10-401, Chap 4 thru 6; https://cadremil.maxwell.af.mil/ws/CWPC/Course_IPs.html (IP 4200)	X	A					
7.3. Describe deployment procedures. TR: AFMAN 10-100; MAJCOM and Local Directives							
7.3.1. Pre-deployment.	X	A					
7.3.2. Employment.	X	A					
7.3.3. Post deployment.	X	A					
7.3.4. Recovery.	X	A					
7.4. Accomplish the following mobility procedures: TR: Applicable MAJCOM directives, TOs 00-20-series							
7.4.1. Pre-deployment inspections.	X*	-					
7.4.2. Air mobility equipment preparation.	X*	-					
7.4.3. Road mobility equipment preparation.	X*	-					
7.4.4. Post-deployment turn around.	X*	-					
8. TYPICAL DEPLOYABLE C-E MISSIONS TR: AFMAN 10-100, MAJCOM and Local Directives							
8.1. Identify basic concepts of the following C-E deployable missions.							
8.1.1. Theater Deployable Communications (TDC)	-	A					
8.1.2. Deployable Air Traffic Control Systems (DATCALS)	-	A					
8.1.3. Engineering & Installation	-	A					
8.1.4. C4ISR Platforms							
8.1.4.1. Air Operations Centers		A					
8.1.4.2. Battlefield Control System	-	A					
8.1.4.3. Air Support Operations Squadrons	-	A					
8.1.4.4. Airborne Platforms	-	A					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
8.1.4.5. Unmanned Aerospace Vehicles (UAVs)	-	A					
9. ELECTRICAL POWER SYSTEMS. TR: Commercial Manuals							
9.1. Describe the application of the following types of uninterruptible power supplies:							
9.1.1. Batteries.	-	A					
9.1.2. Switched electrical power systems.	-	A					
9.2. Describe the application of the following types of generators:							
9.2.1. Fixed.	-	A					
9.2.2. Deployable	-	A					
10. 2E1X1 CAREER FIELD MISSIONS.							
10.1. Satellite Communications Missions							
10.1.1. Identify the purpose, capabilities, and limitations of the Defense Satellite Communications System (DSCS). TR: DISA Circular 800-70-1, Chap 3	-	B					
10.1.2. Identify the purpose, capabilities, and limitations of MILSTAR. TR: http://www.af.mil/factsheets/factsheet.asp?fsID=118	-	B					
10.1.3. Commercial Satellite Communications							
10.1.3.1. Identify the purpose, capabilities, and limitations of Narrow band satellite services (e.g. Iridium, Inmarsat, Global Star).	-	B					
10.1.3.2. Identify the purpose, capabilities, and limitations of Wideband satellite services (e.g. Eutelsat, Intelsat, Xstar)	-	B					
10.2. Space Systems Missions							
10.2.1. Identify the purpose, capabilities, and limitations of the Defense Meteorological Satellite Program (DMSP). TR: http://dmsp.ngdc.noaa.gov/dmsp.html	-	B					
10.2.2. Identify the purpose, capabilities, and limitations of the Defense Support Program (DSP). TR: http://www.af.mil/factsheets/factsheet.asp?fsID=96; http://www.milnet.com/milnet/dsp.htm	-	B					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
10.2.3. Identify the purpose, capabilities, and limitations of the Navstar Global Positioning System Program (GPS). TR: See 31S1-2FSQ141-01 GPS LOAP for publications; http://www.af.mil/factsheets/factsheet.asp?fsID=119	-	B					
10.3. Test Range Mission.							
10.3.1. Identify the purpose, capabilities, and limitations of the Test Range Mission. TR: TO 31-1-141-13, applicable TOs and manuals, Range Commanders Council (RCC) Document 106 (Current)	-	B					
10.3.2. Identify the purpose, capabilities, and limitations of instrumentation and telemetry systems. TR: http://www.dtepi.mil/tm/index.html	-	B					
11. COMMON 2E1X1 PRINCIPLES.							
11.1. Identify the principles of orbital mechanics.	-	B					
11.2. Identify the principles of RF transmission theory.	-	B					
11.3. Satellite System Segments.							
11.3.1. Identify the principles, capabilities, and limitations of a Space Segment.	-	B					
11.3.2. Identify the principles, capabilities, and limitations of a Command and Control Segment.	-	B					
11.3.3. Identify the principles, capabilities, and limitations of a Terminal Segment.	-	B					
11.4. Identify the principles of acquisition and tracking.	-	B					
11.5. Identify basic facts of satellite look angle calculations.	-	A					
11.6. Identify the principles of protecting electronic systems from effects of electromagnetic interference (EMI).	-	B					
11.7 Identify the principles of protecting electronic systems from effects of electromagnetic pulse (EMP).							
11.8. Identify the principles, capabilities, and limitations of airborne antenna systems.	-	B					
11.9. Identify the principles, capabilities, and limitations of ground antenna systems.	-	B					
11.10. Tracking Systems. TR: Applicable TOs and manuals							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
11.10.1. Identify the principles, capabilities, and limitations of the tracking feed system.	-	B					
11.10.2. Identify the principles, capabilities, and limitations of the scanner.	-	B					
11.10.3. Identify the principles, capabilities, and limitations of the tracking downconverter.	-	B					
11.10.4. Identify the principles, capabilities, and limitations of the antenna position control and indicators.	-	B					
11.10.5. Identify the principles, capabilities, and limitations of antenna drive systems.	-	B					
11.11. Identify principles, capabilities, and limitations of control, monitoring, and alarm equipment.	-	B					
11.12. Transmit Systems. TR: Applicable TOs or manuals							
11.12.1. Identify the principles, capabilities, and limitations of transmit systems.	-	B					
11.12.2. Identify the principles, capabilities, and limitations of upconverters.	-	B					
11.12.3. Identify principles, capabilities, and limitations of power amplifiers (PA).	-	B					
11.13. Receive Systems. TR: Applicable TOs or manuals							
11.13.1. Identify the principles, capabilities, and limitations of receive systems.	-	B					
11.13.2. Identify the principles, capabilities, and limitations of low noise amplifiers (LNA).	-	B					
11.13.3. Identify the principles, capabilities, and limitations of downconverters.	-	B					
11.14. Information Processing.							
11.14.1. Identify principles, capabilities, and limitations of modems.	-	B					
11.14.2. State general principles of fiber optic theory.	-	B					
11.14.3. Identify the principles, capabilities, and limitations of fiber optic multiplexers.	-	B					
11.14.4. Identify the principles, capabilities, and limitations of fiber optic modems.	-	B					
11.14.5. Identify characteristics of the IEEE-488 parallel buss	-	B					
11.14.6. Identify the purpose, capabilities, and limitations of the MIL STD 1553 avionics buss.	-	B					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
11.14.7. Identify the principles, capabilities, and limitations of Network Bandwidth Management equipment.	-	B					
11.15. Timing and Frequency Standards.							
11.15.1. Identify the principles, capabilities, and limitations of timing and frequency distribution systems.	-	B					
11.15.2. Identify the principles, capabilities, and limitations of GPS timing receivers.	-	B					
12. 2E1X1 SYSTEMS AND EQUIPMENT.							
12.1. Satellite Equipment.							
12.1.1. Identify the principles, capabilities, and limitations of SHF Satellite terminals.	-	B					
12.1.2. Identify the principles, capabilities, and limitations of UHF Satellite terminals.	-	B					
12.1.3. Identify principles, capabilities, and limitations of EHF Satellite terminals.	-	B					
12.1.4. Identify principles, capabilities, and limitations of commercial satellite systems.	-	B					
12.2. Space Systems Equipment.	-	B					
12.2.1. Identify the principles, capabilities, and limitations of Defense Meteorological Satellite Program equipment.	-	B					
12.2.2. Identify the principles, capabilities, and limitations of Defense Support Program equipment.	-	B					
12.2.3. Identify the principles, capabilities, and limitations of Navstar GPS equipment.	-	B					
12.3. Instrumentation and Telemetry Equipment.							
12.3.1. Identify the principles, capabilities, and limitations of instrumentation and telemetry equipment.	-	B					
12.4. Wideband Equipment.							
12.4.1. Identify principles, capabilities, and limitations of line-of-sight radio systems.	-	B					
12.4.2. Identify principles, capabilities, and limitations of troposcatter radio systems.	-	B					
13. PERFORMANCE ASSESSMENT. TR: DISA Circulars 300-175-9, 310-70-1, and 310-70-75; MIL-STD-188-100; Applicable circuit/system standards							
13.1. Identify facts and terms associated with performance assessments.	-	A					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
13.2. Identify circuit and link performance standards.	X*	-					
13.3. Perform system testing.	X*	-					
13.4. Compile systems test data.	X*	-					
13.5. Evaluate systems test data.	X*	-					
13.6. Perform c/kt measurement.	X*	-					
13.7. Monitor circuit and link quality.	X*	-					
14. OPERATIONS. TR: Army Space Command (ASC) 1, Applicable DISA Circulars, CJCSI 6250.01, TOs, manuals, and System Control and Operational Concepts (SCOC)							
14.1. Identify the principles of establishing a communications link.	-	B					
14.2. Identify facts and terms associated with Counter-Counter Measures.	-	A					
14.3. Identify general principles of the Satellite Access Request/Gateway Access Request (SAR/GAR) process.	-	B					
14.4. Identify After Action Report procedures.	X*	-					
14.5. Maintain station logs.	X*	-					
14.6. Accomplish the following DISA report requirements: TR: DISA Circulars 270-A85-1, 800-70-1, and 310-55-1							
14.6.1. SATCOM Equipment Reports (SERS).	X*	-					
14.6.2. HAZCON reports.	X*	-					
14.6.3. Voice and data orderwire reporting.	X*	-					
200. AIR FORCE JOB QUALIFICATION STANDARDS APPLICABLE TO AFSC 2E151. TR: AFI 21-116, 36-2233, CFETP 2E1X1 (See Notes 3 and 4)							
200.2. AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training. (See Note 2)	X						
201.3. AFJQS 2EXXX-201C, Corrosion Prevention and Control.	X						
201.5.1. AFJQS 2EXXX-201EA, Communications-Electronics (C-E) Core Automated Maintenance System (CAMS) with GUI.	X*						
201.6. AFJQS 2EXXX-201F, Maintenance Control	X*						
201.7. AFJQS 2EXXX-201G, Quality Assurance.	X*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
201.8. AFJQS 2EXXX-201H, Work Center Deficiency/Discrepancy Reporting.	X*						
201.10. AFJQS 2EXXX-201J, Maintenance Training Program.	X*						
201.16. AFJQS 2EXXX-201P, Work Center Test Equipment Management.	X*						
201.23. AFJQS XXXXX-201W, Integrated Digital Network Exchange (IDNX 90).	X*						
201.24. AFJQS 2EXXX-201X, E & I Quality Assurance.	X*						
202.1. AFQTP 2EXXX-202A, Electrostatic Discharge Familiarization Handbook.	X*						
202.2. AFJQS 2EXXX-202B, SIPT Electronics and Inside Plant (E&I).	X*						
202.4. AFQTP 2EXXX-202D, EI TEMPEST Installation Handbook.	X*						
203.20. AN/TRC-170 Radio Set. Supplemental Course: E3AZP2E151 000							
203.20.1. AFJQS 2E1X1-203TA, AN/TRC-170(V2) & (V3) Mobile Tropo Radio Set.	X*						
203.20.3. AFJQS 2E1X1-203TC, AN/GRC-239, Tropo Satellite Support Radio.	X*						
203.22. AFJQS 2EXXX-203V, AN/PSC-5 Spitfire.	X*						
204.22. AFJQS 2E1X1-204V, AN/FCC-100(V)7 Multiplexer Set.	X*						
205.1. AFJQS 2E1X1-205A, AN/TSC-152 Lightweight Multi-band Satellite Terminal (Trailer).	X*						
205.3. AFJQS 2E1X1-205C, AN/TSC-154 Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)	X*						
206.25. AFJQS 2EXXX-206Y, AN/GSC-42(V) AFSATCOM Terminal.	X*						
206.26. AFJQS 2EXXX-206Z, Advanced Narrowband/ Wideband Communications Systems Concepts.	X*						
207.14. Ground Mobile Forces (GMF) Satellite Terminals. Supplemental Course: E3AZP2E151 001							
207.14.1. AFQTP 2E1X1-207NA, GMF Satellite Terminal Familiarization.	X*						
207.14.2. AFJQS 2E1X1-207NB, AN/TSC-94A(V)1/2 & AN/TSC-100(V)1/2 Ground Mobile Forces Satellite Communications Terminal.	X*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
207.14.3. AFJQS 2E1X1-207NC, AN/TSC-85B(V)2 & AN/TSC-93B(V)2 NABS Terminals.	X*						
207.19.1. AFQTP 2E1X1-207SA, Defense Communications Subsystem (DCSS) Functional Analysis.	X*						
207.19.2. AFJQS 2E1X1-207SB, AN/USC-28(V) Satellite Communications Set. Supplemental Course: E5AZA2E151 039	X*						
207.19.6. AFJQS 2E1X1-207SF, Standard Tactical Entry Point (STEP).	X*						
208.1. AFJQSXXXXX-208A, Ultra High Frequency Demand Assigned Multiple Access Familiarization.	X*						
208.4. AFJQS2E1X1-208D, AN/USC-60A Flyaway Tri-Band Satellite Terminal (FTSAT)	X*						
208.5. AFJQS 2E1X1-208E, AN/FRC-175 Peace Keeper AFSATCOM System.	X*						
208.6. AFJQS 2E1X1-208F, AN/FRC-175 Minuteman AFSATCOM System.	X*						
209.4. AFJQS 2EXXX-209D, 6KNZE: C-E SATCOM /Wide-Band Augmentation	X*						
209.5.4. AFJQS 2EXXX-209ED, Air Force Mission Support System (AFMSS).	X*						
209.6. AFJQS 2E1X1-209F, AN/UMQ-13, MARK IVB Meteorological Data Station	X*						
210.23. AFJQS 2E1X3-210W, Personal Wireless Communications Systems	X*						
215.1. AFJQS 2E1X1-215A, AN/PSC-11 Single Channel Anti-Jam Manportable Terminal	X*						
215.2. AFJQS 2EXXX-215B, AN/FSC-125 Fixed Site Single Channel Anti-Jam Manportable (SCAMP) (FSS) Communication Set.	X*						
215.6. AFJQS 2E1X1-215F, AN/FSC-97 Single Channel Transponder Injection System (SCTIS).	X*						
215.10. AFJQS 2E1X1-215J, AN/GSC-52 Medium Satellite Communications Terminal. Supplemental Course: E3AZA2E151 051	X*						
215.13. AFJQS 2E1X1-215M, AN/FSC-111 ICBM SHF Satellite Terminal (ISST).	X*						
215.14. AFJQS 2E1X1-215N, AN/FRC-181 (V)1,2,3 MILSTAR Terminals. Supplemental Course: E3AZP2E151 007	X*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
216.2. AFJQS 2E1X1-216B, Inter Continental Ballistic Missile (ICBM) Telemetry.	X*						
216.3. AFJQS 2E1X1-216C, Laser and Optics Systems Handbook.	X*						
216.6. AFJQS 2E1X1-216F, Small Munitions Data Acquisition.	X*						

BEHAVIORAL FORMAT CTG CODING SYSTEM

Each CTG element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided.

Code	Definition
A	Subject Knowledge Level - Can identify basic facts and terms about the subject. (FACTS)
B	Subject Knowledge Level - Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES)
C	Subject Knowledge Level - Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
D	Subject Knowledge Level - Can evaluate conditions and make proper decisions about the subject. (EVALUATION)
-	When this code is used in the OJT Upgrade Column it indicates that the certification or qualification on this task is a local determination. When this code is used in the CDC Column it indicates that no training for this subject is provided in the CDCs.
X	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level. This code indicates that training to satisfy this requirement is either provided through OJT, CDCs, CBTs or a combination of OJT, CBTs and CDCs.
X*	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level if the assigned duty position is responsible to maintain/operate the equipment or system indicated as assigned by the local work center supervisor. This code indicates that training to satisfy this requirement is normally provided through OJT.

CDC column. The use of proficiency coding indicates the level of knowledge training provided by the CDCs, The CDC column will now identify the subject knowledge level covered in the CDC. The “K” will no longer be used to identify the knowledge covered in the CDC. Information pertaining to the meaning of the code can be located in the CTG coding system table.

CFETP versus AFJQS task coding. AFJQSs/AFQTPs annotated in the CFETP with an “X” denotes the AFJQS is mandatory. Within the AFJQS are individual tasks that are coded either “X” or “X*”. If the tasks are coded “X,” they are mandatory. If coded “X*,” they are duty position specific.

The identification blocks listed below are to be used to list all personnel authorized to sign off tasks in Part II of the CFETP, including automated CFETP's as per AFI 36-2201, Vol 3.

THIS BLOCK IS FOR IDENTIFICATION PURPOSES ONLY Personal Data - Privacy Act of 1974		
PRINTED NAME OF TRAINEE *(Last, First, Middle Initial)*	INITIALS *(Written)*	SSAN
PRINTED NAME OF TRAINER AND WRITTEN INITIALS		
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	

PREFACE

NOTE 1: Users are responsible for annotating technical references to identify current references pending STS revision. Locate current publications at.

DOD Issuances and OSD Administrative Instructions at http://www.dtic.mil/whs/directives/
Air Force publications at http://www.e-publishing.af.mil/.
AFSSIs at https://private.afca.af.mil/ip/
AFIND 5, DISA Circulars and Instructions at https://edge.disa.mil/ca/pubs/
Technical Orders (TO) at https://www.toindex-s.wpafb.af.mil/
Online ReferenceWare and CBTs: https://www.my.af.mil/faf/FAF/fafHome.jsp (Select "IT E-Learning" link under *Top Viewed: Training*)

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
70. DEPLOYMENT CONCEPTS. TR: AFI 10-201, AFI 10-244, AFI 10-401 https://www.afma.randolph.af.mil/orgunits/MAS/WartimeReadiness/Training/TrainingAids/Wartimeoverview.doc https://www.afma.randolph.af.mil/orgunits/MAS/WartimeReadiness/Training/TrainingAids/UTMSummary.doc							
70.1. Describe the purpose of the following:							
70.1.1. OPLAN communications requirements.	X	-					
70.1.2. Time Phased Force Deployment Data (TPFDD).	X	-					
70.1.3. Status Of Resources and Training Systems (SORTS).	X	-					
70.1.4. AEF Reporting Tool (ART).	X	-					
70.1.5. UTC development process.	X	-					
70.1.6. UTC adjustment procedures.	X	-					
70.1.7. Initial Support Element (ISE)							
70.1.7 1. Advanced Echelon (ADVON).	X	-					
70.1.7.2. Main Base.	X	-					
70.1.7.3.. Bare Base.	X	-					
70.2. Deployment Procedures. TR: AFIs 10-403, 13-216, 21-109, 33-201, and 33-211; AFMAN 23-110							
70.2.1. Develop load plan.	X*	-					
70.2.2. Explain pallet build-up procedures.	X*	-					
70.2.3. Explain hazardous cargo preparation.	X*	-					
70.2.4. Prepare documentation.	X*	-					
70.2.5. Determine site selection requirements.	X*	-					
70.2.6. Determine site preparation requirements.	X*	-					
70.2.7. Determine site configuration requirements.	X*	-					
70.2.8. Determine requirements for constructing deployment site utility grids.	X*	-					
70.2.9. Describe control of COMSEC material.	X*	-					
70.3. STATE FACTS RELATED TO THE FOLLOWING C-E FACILITY MANAGEMENT AREAS: TR: AFI 21-116 ATTCH 11, 32-1065, AFCEMI 300-7, TO 00-25-108, 31-10-24							
70.3.1. Grounding.	X*	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
70.3.2. Lightning Protection.	X*	-					
70.3.3. Antenna PMI Procedures.	X*	-					
70.3.4. Mobile Depot Maintenance.	X*	-					
70.3.5. RF Radiation Hazards.	X*	-					
70.4. Accomplish the following site engineering tasks: TR: ASC-1, CJCSI 6250.01, appendix C, applicable technical data							
70.4.1. Crew assignment sheets.	X*	-					
70.4.2. Satellite Access Request	X*	-					
70.4.3. Gateway Access Request.	X*	-					
70.4.4. Satellite Database (SDB)	X*	-					
70.4.5. Path Profile.	X*	-					
70.4.6. Siting of Equipment.	X*	-					
70.4.7. Equipment Grounding.	X*	-					
70.4.8. Lightning Protection.	X*	-					
71. SYSTEM PLANNING AND IMPLEMENTATION. TR: AFI 33-104 and AFI 21-404; TO 32-series; AFQTP 2EXXX-202B							
71.1. Identify systems support requirements for new or modified systems.	X	-					
71.2. Describe how to manage planning and implementation of new systems.	X	-					
72. WORKCENTER MANAGEMENT							
72.1. State facts relating to the following work center management principles. TR: AFQTP 2EXXX-201L							
72.1.1. Principles of management.	X	-					
72.1.2. Training.	X	-					
72.1.3. Supply.	X	-					
72.1.4. Core Automated Maintenance System (CAMS).	X	-					
72.1.5. Work center management.	X	-					
72.1.6. Safety and security.	X	-					
72.1.7. Maintenance standards.	X	-					
72.1.8. Performance reports.	X	-					
72.1.9. Awards and recognition.	X	-					
72.1.10. Mobility/deployment.	X	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
72.1.11. Manpower.	X	-					
72.1.12. Financial management.	X	-					
72.1.13. Publications management.	X	-					
73. MILITARY SATELLITE COMMUNICATIONS. TR: CJCSI 6250.01							
73.1. Describe the infrastructures and levels of responsibility in MILSATCOM to include commercial satellite communications.	X	-					
74. GENERAL CONCEPTS.							
74.1. Explain the principles, capabilities, and limitations of the following types of satellites (space segment): TR: Joint Pub 6-02, Chap 4							
74.1.1. Defense Satellite Communications System (DSCS) TR: DISAC 800-70-1 Chap 18	X	-					
74.1.2. MILSTAR.	X	-					
74.1.3. UHF Follow On (UFO).	X	-					
74.1.4. Commercial C, Ku, K, X and Ka band.	X	-					
74.1.5. Commercial L band. TR: https://private.afca.af.mil/mss/ http://www.iridium.com; http://www.inmarsat.com/home.aspx	X	-					
74.2. Principles of Spectrum Interference. TR: AFI 10-707; CJCSI 3320.02A; AFSPC Pamphlet 15--2							
74.2.1. Explain different types of interference.	X	-					
74.2.2. Describe Identification methods.	X	-					
74.2.3. Identify Countermeasures.	X	-					
74.2.4. Explain Reporting procedures.	X	-					
74.3. Explain the capabilities, limitations, and integration of the following types of systems (ground segment): TR: AFIs 10-403 and 25-101; AFMAN 23-110							
74.3.1. Satellite systems and equipment. TR: Applicable Technical Manuals, Commercial Manuals, and DISA Circulars							
74.3.1.1. DSCS.	X*	-					
74.3.1.2. MILSTAR.	X*	-					
74.3.1.3. UFO.	X*	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
74.3.1.4. Commercial C, Ku, K, X, and Ka band systems.	X*	-					
74.3.1.5. Commercial L band systems.	X*	-					
74.3.2. Terrestrial systems and equipment.							
74.3.2.1. Troposcatter.	X*	-					
74.3.2.2. Fixed microwave.	X*	-					
74.3.2.3. Tactical microwave.	X*	-					
75. SYSTEM CONTROL AND REPORTING. TR: DISAC 310-70-1							
75.1. Explain the DISA system hierarchy	X*	-					
75.2. Explain DISA reporting procedures.	X*	-					
75.3. Explain circuit activation/deactivation procedures	X*	-					
76. COMMUNICATIONS-ELECTRONICS MANAGEMENT							
76.1. AFQTP 2EXXX-201LB, Communications-Electronic (C-E) Manager's Handbook.	X*	-					

Section B - Course Objective List

4. This section not used.

Section C - Support Materials

5. The following is a list of available support materials.

5.1. **Computer Based Training Products.** Air Force computer based training products can be found at https://www.my.af.mil/faf/FAF/fafHome.jsp (Select "IT E-Learning" link under *Top Viewed: Training*).

5.2. **Air Force Job Qualification Standards and Air Force Qualification Training Packages**

5.2.1. Refer to http://www.e-publishing.af.mil/, product announcements, for the list of published AFJQSs/AFQTPs.

5.2.2. A list of applicable AFJQs\AFQTPs for AFSC 2E1X1 and additional AFJQS/AFQTP pertaining to maintenance management and generic training products can be found at https://wwwmil.keesler.af.mil/81trss/qflight/index.htm

5.2.3. For information on how to request development of AFJQSs/AFQTPs refer to AFI 36-2233, *Air Force On-the-Job Training Products for Communications-Electronics Enlisted Specialty Training*,

5.2.4. Additional AFJQS/AFQTP maintenance management and generic training products applicable to this specialty

Publication No.	Pseudo File Code	Publication Title
AFJQS 2EXXX-200B	2EXXX-200.2	2EXXX C-E Enlisted Specialty Training
AFJQS 2EXXX-201C	2EXXX-201.3	Corrosion Prevention and Control
AFJQS 2EXXX-201EA	2EXXX-201.5.1.	Communications-Electronics Core Automated Maintenance System
AFJQS 2EXXXX-201F	2EXXX-201.6.	Maintenance Control
AFJQS 2EXXX-201G	2EXXX-201.7	Quality Assurance
AFJQS 2EXXX-201H	2EXXX-201.8	Work Center Deficiency/Discrepancy Reporting
AFJQS 2EXXX-201J	2EXXX-201.10	Maintenance Training Program
AFQTP 2EXXX-201L	2EXXX-201.12	Communications-Electronics (C-E) Work Center Manager's Handbook
AFQTP 2EXXX-201LB	2EXXX-201.12.2	Communications-Electronic (C-E) Manager's Handbook
AFJQS 2EXXX-201P	2EXXX-201.16	Work Center Test Equipment Management
AFJQS 2EXXX-201X	2EXXX-201.24	Engineering Installation (EI) Quality Assurance
AFQTP 2EXXX-202A	2EXXX-202.1	Electrostatic Discharge Familiarization Handbook
AFJQS 2EXXX-202B	2EXXX-202.2	SIPT Electronics and Inside Plant (E&I)
AFQTP 2EXXX-202D	N/A	EI Tempest Installation Handbook
AFJQS 2EXXX-209C	2EXXX-209.3	6KNZF: C-E Airfield and Weather Systems Support
AFJQS 2EXXX-209L	2EXXX-209.12	6KNZL: C-E METNAV Operations Maintenance
AFJQS 2EXXX-209P	2EXXX-209.16	6KNZG: C-E C-2 Radio System Support
AFJQS 2EXXX-209Q	2EXXX-209.17	6KNZN: C-E Personal Wireless Communications (PWCS) Support
AFJQS 2EXXX-209S	2EXXX-209.3	6KNZP: C-E Base Communications Systems Support
AFJQS 2EXXX-209W	2EXXX-209.23	6KNZK: C-E Tactical Telephone Switching Systems Support
AFJQS 2EXXX-210K	2EXXX-210.11	6KNZ7: C-E Crypto/computer systems support
AFJQSXXXXX-208A	N/A	Ultra High Frequency Demand Assigned Multiple Access familiarization
AFJQSXXXXX-212Z	N/A	Global Broadcast Service Ground Receive Suite

Section D - Training Course Index

6. The following is a list of the available Air Force in-residence, field, and/or exportable training courses. For information on all formal courses, refer to the Air Force Education and Training Course Announcements (ETCA) database, formerly AFCAT 36-2223, USAF Formal Schools Catalog at https://etca.randolph.af.mil/.

Course Number	Course Title	Location
ECABP2E131 01AA	Satellite, Wideband and Telemetry Systems Apprentice	Ft Gordon
ECAZP2E151 01AA	AN/TRC-170 O/I Maintenance	Ft Gordon
ECAZP2E151 01BA	Tactical Satellite Communications O/I Maintenance	Ft Gordon
ECAZP2E151 01DA	MILSTAR Organizational Maintenance	Ft Gordon
EBAZA2E151 01AA	AN/USC-28 I/O Terminal Maintenance	
E7AST2E151 01AA	Tactical Satellite Communication Systems	
E7AST2E151 01BA	AN/TSC-168 TDC Quad-Band HUB SATCOM Terminal	
EBAZA2E151 01CA	Joint Task Force Systems	Ft Gordon
E9AZA2E151 01AA	SMART-T Terminal Operator/Maintainer	Ft Gordon
EBAZA2E151 01BA	SATCOM Strategic Terminals	
EBAZA2E151 01DA	Digital Communications Satellite Subsystem(ARMY #102-F40)	
EBAZA2E151 01EA	MILSTAR Communications Planning System (CPS)	
ECAZP2E151 01EA	AN/USC-60A Flyaway Tri-Band Satellite Terminal (FTSAT) O/M	
ECAZP2E151 01GA	AN/TSC-168 TDC Quad-Band HUB SATCOM Terminal	
ECAZP3C151 01AA	MILSTAR Command Post Terminal Operator	

Section E - MAJCOM Unique Requirements

7. There are currently no MAJCOM unique requirements. This area is reserved.